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THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF PUBLIC INSTRUCTION
PHILIPPINE HEALTH SERVICE

P.I. Bureau of Public Health
HEALTH BULLETIN NO. 21

Management of Communicable Diseases

WRITTEN AND COMPILED BY

Dr. Eugenio Hernando,
Chief, Division of Sanitation in the Provinces

UNDER THE DIRECTION OF

Dr. Vicente de Jesus,
Acting Director of Health

MANILA
BUREAU OF PRINTING
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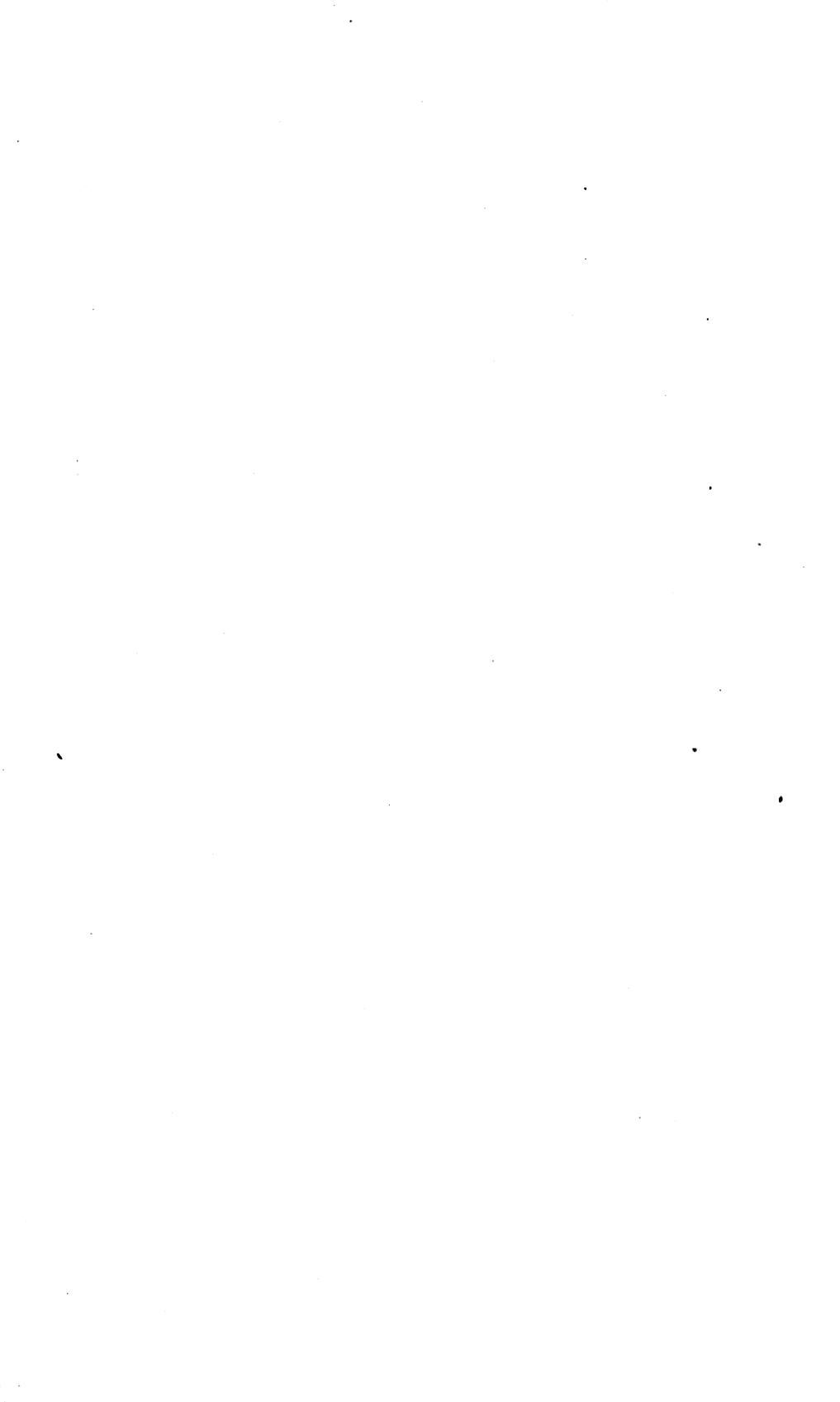
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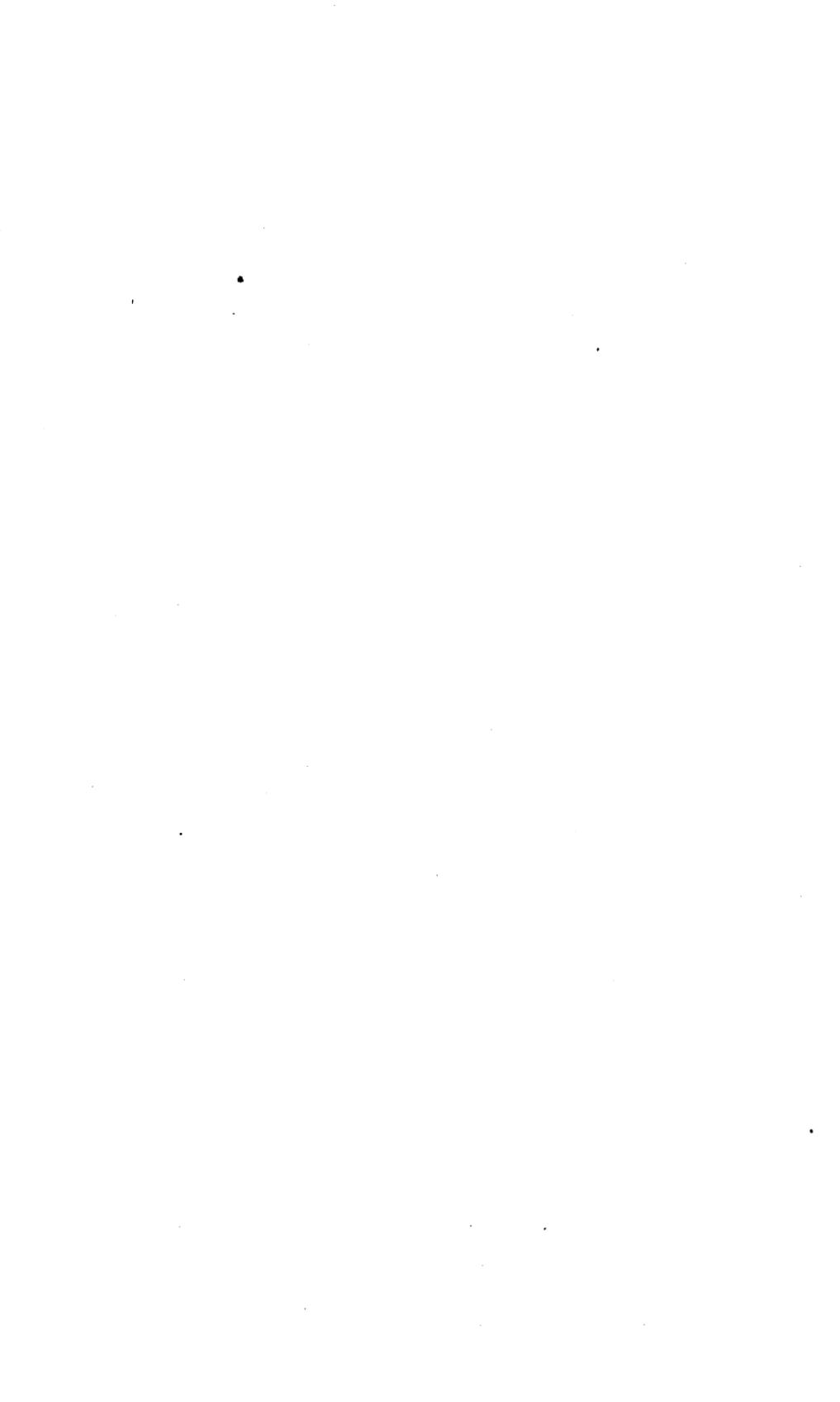
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FOREWORD

This bulletin is nothing but a compilation from standard treatises on hygiene and sanitation. There is, therefore, but little original matter, if any, in the book, but it contains in an abridged form about all that is known and practised nowadays in connection with the management of communicable diseases. The purpose of the bulletin is to enable health officers to have at all times a reference résumé of modern public health work, which will serve them as a guide in routine sanitary practice.

V. JESUS,
Acting Director of Health.



PREFACE.

THE ENVIRONMENT IN RELATION TO INFECTIOUS DISEASES. (The New Public Health).

In dealing with infectious diseases, it would be well to make a revision of our conceptions of public health. The majority of us are, of course, familiar enough with recent changes in scientific thought, yet have not fully realized what those changes mean. Few, even, have noted that health as held at present means much more than the mere absence of disease; that disease prevention is considered as being more important than disease suppression, and promotion of health given precedence over both; and that our ultimate ideal is the attainment of social health and national welfare through the securing of individual health in its true sense—the highest physical efficiency for the greatest period of time.

The shifting of views have resulted in the “New Public Health.” The old was concerned with the environment; the new with the individual. The old sought the sources of infections in the surroundings of man; the new finds them in the man himself. The old public health sought the sources of infectious disease in the air, in the water, in the earth, in the climate and topography of localities, in the temperature of the soils at 4 and 6 feet deep, in the rise and fall of ground-waters; it failed because it sought them, very painstakingly and exhaustively, it is true, in every place and every thing *where they were not*. The new public health seeks these sources—and finds them—*amongst infective persons (or animals)* whose excreta or other constituents or body contents enter the bodies of other persons.

The environment has therefore lost its old terrors and nightmares for us. It is no longer held that infectious diseases bred in the foul, ill-smelling, unventilated, sunless hovels of the poor; that the garbage-pail is in itself and by itself intrinsically bad, disease-producing and deleterious to health, if infected discharges are not accessible to them; that defective plumbing has nothing to do with disease-generation or disease propagation whatever, unless perchance there be actual gross leakage of infected sewage. The modern sanitarian cares nothing, so far as restriction

of disease and death is concerned, for the dirty back yard or the damp zaguan in themselves, but only as they may enter into the transmission of infective discharges.

While admitting freely that almost any item of an environment may act as a route of infection, at odd times, or under peculiar conditions, the New Public Health holds that surroundings only act in two ways: First, unequivocally and without reserve such environments as permit or encourage or, still worse, necessitate the exchange of excreta in ordinary life, contribute ultimately to the spread of disease since they insure a similar exchange of infected excreta so soon as the latter are introduced. Take over-crowding, for example. If the overcrowded be disciplined, intelligent, and take proper precautions to avoid exchange of excreta, over-crowding does not necessitate the spread of the infection, even if it be introduced. On the other hand, infection may spread, and frequently does without over-crowding, if the essential factor of such spread exist, i. e., the transmission of infected excreta.

Second, environments that are bad from a physical standpoint (bad for the body) are often held to act in spreading infection indirectly by "depressing vitality" to an extent that makes infection, if received, more likely to develop (and if it develops, more successful in injuring the body). However, evidence on this point, except perhaps as relates to tuberculosis and pneumonias, is very slight.

It appears, then, that environment as affecting bodily functions has little to do directly with the incidence of most of the specific infections. The *sine qua non* of all infectious diseases are their specific agents, and since the chief sources (infective persons) of these are known, the most logical efforts are those which concentrate on the prevention of the dissemination of these agents from these sources.

CONTROL OF EPIDEMICS

PART I.

PLAN FOR THE MANAGEMENT OF EPIDEMICS.

1. *General principles.*—The scientific safeguarding against the occurrence of epidemics is of the utmost importance. To prevent epidemics the efforts of the health officers should be chiefly devoted toward the discovery of the first cases of any communicable disease, as well as the detection of all contacts, suspected cases and carriers, and the taking of such other measures as would prevent the spread of the disease.

Energetically handled a situation often loses its threatening aspect almost at once.

The means that the health officers can use for handling epidemics are the following:

(a) Reporting of cases; (b) house to house inspection; (c) isolation of patients; (d) establishment of emergency hospitals; (e) quarantine; (f) maps; (g) disinfection; (h) immunization; (i) supervision of carriers; (j) cleanliness; (k) regulations; (l) educational campaign.

2. *Reporting.*—Cases of communicable diseases should be reported within a period of twenty-four hours or less to the local health office in order that proper action may be taken. The reporting should be made by householders, free-holders, attendants, physicians, and whoever has knowledge of a suspected or real case of any communicable disease.

It should also be the duty of health officers, upon hearing, from any source, of a suspicious case, to investigate and satisfy themselves as to its nature and to make use of any kind of information that will lead to the discovery of any suspicious or real case of communicable disease, no matter whether the information be anonymous or confidential. If the health officer would only explain to the physicians in any locality the reasons why he requests information on such matters full coöperation will surely be extended.

3. *House to house inspection.*—The value of home visitation has been appraised to such an extent that health officers readily realize how helpless they would be without this simple but very powerful means of attacking communicable disease. Home visitation aims to bring to light other cases of the disease in the same

family or neighbors; it strives, to trace, if possible, the cause or source of the infection; it seeks to learn what influence the patient's environment has on the spread of the diseases; it attempts to devise means to prevent further cases. In short, home by home visitation constitutes the most necessary means for the detection of concealed cases.

In this connection, we feel obligated to quote from an editorial in the professional review section of the *New York Medical Journal* the following with reference to home visitation:

* * * Home visitation undoubtedly supplies the surest way to reach the indifferent and ignorant portion of the public, and every one familiar with public health administration knows that this constitutes the great obstacle in the successful prevention of disease. These people cannot be reached through public lectures or through printed circulars of information, or yet through exhibitions; such methods are all far too indirect, too impersonal. But visit the people in their homes, show them that your interest is personal, help them with their individual problems, teach them the wherefore—and the solution of many difficult health problems lies close to hand. This has been well shown by the success attending the work carried on against tuberculosis and by the splendid results obtained in New York in recent years through the campaign against infant mortality. * * * It is evident, from what has been said, that the only effective means of reaching a very large part of the population will be closed to the public health administrator if home visitation is interfered with, and it is equally clear that there can be no home visitation without notification to and registration of the cases by the health authorities.

Public health administrators are beginning to realize that home visitation is a method not merely applicable to, but almost indispensable in many public health problems, and that in order to make further progress, it is essential to introduce this as one of the routine methods of public health work.

Cases which have been placed under isolation should be inspected. Otherwise in careless families or with mild cases, there is great likelihood that the measures prescribed will not be entirely and effectively carried out. Even careful and intelligent people frequently need additional advice and guidance and may get into difficulties if left entirely to themselves for an entire isolation period.

It scarcely needs to be said that mild, atypical and carrier cases should be subject to the same measures as the severe and typical. It is just such cases that are most implicated in spreading disease. This is a point which the public does not understand. Mild cases and carriers may give rise to severe cases and vice versa.

Contacts must be held under surveillance. Such persons may or may not develop the disease but due to their potentiality to spread disease it is the health authorities' duty to keep them under surveillance.

4. *Isolation.*—The most effective way to isolate patients is to gather them into hospitals. Isolation in a private family is rarely complete and a disease frequently spreads among the inmates of a quarantined house, but, as isolation in a private family is still one of the methods allowed in the Philippines for certain communicable diseases, the following points, which are the principal requirements of a proper isolation, taken from McNutt's book, should be observed:

(a) The room chosen for isolation should be in as retired a part of the house as possible, preferably in an upper story, away from living and dining rooms and kitchen. It should contain no unnecessary furnishings, and carpets, curtains, upholstery and the like should so far as practicable be removed.

(b) The door should be kept closed and a small placard may be placed upon it as a deterrent to children and other possible intruders.

(c) The sick-room should be screened, if necessary, to exclude flies and other insects. Flies in and about the sick-room should be killed as being possibly infected. Animal pets which are fondled by children may carry infection. It would be wise to give pets which have been exposed a thorough washing. They may be isolated with the patient provided they are not allowed to pass out and mingle with the rest of the family, and should be washed at the close of the isolation. Cats should be regarded with suspicion as they are known to become occasionally true "carriers" of diphtheria, the infection being seated in the nose of the animal.

(d) *One person*—preferably a trained nurse—should act as *nurse* and should be isolated with the patient. If the mother of a family endeavors to act as nurse and at the same time cook and care for well children in the family, she is likely to infect the latter unless extreme care is taken.

(e) The nurse should guard against "contact" infection of the various kinds including "droplet infection." Through washing and disinfection of the hands is a prime essential. If the person acting as nurse cannot be isolated with the patient, she may wear a gown or wrapper and a head covering while in the sick room, putting it off at the door when leaving the room. Care should be taken in regard to possible infection of the bath-room and toilet, e. g., through disposal of discharges. Patient and nurse should, if possible, have a bath and toilet separate from the rest of the family.

(f) The nurse must see that all discharges which may convey infection are promptly disinfected or burned. Articles (including eating utensils and remnants of food) which may be infected must receive similar treatment. The disinfection should so far as possible be performed in the sick-room, but it may be more convenient to place dishes, bedding, and the like in a vessel outside of the door, to be disinfected, e. g., by boiling. More reliance is to be placed in fire and heat than in chemical disinfectants, which

may be expensive, dangerous, inefficient, or not adapted to use by unskilled persons.

(g) Finally, if a proper home isolation cannot be assured, the patient should be removed to the isolation hospital.

5. *Emergency hospitals.*—The ideal condition in the management of communicable diseases is the free use of emergency hospitals to which the patient should be removed as soon as the clinical or bacteriological diagnosis is established. In most rural places in the Philippines this is the only way of preventing the spread of disease as the employment of quarantine guards day and night in the houses infected is deceptive and open to corruption.

The supplies needed for an emergency hospital for fifty patients are the following as has been noted in Circular Q-74 of this office, dated October 28, 1918:

- 50 G. M. Cots (canvas cots).
- 10 Bed pans.
- 10 Urinals, for males.
- 10 Urinals, for females.
- 4 Pots, cooking.
- 2 Kettles.
- 4 Lanterns.
- 6 Buckets, G. I.
- 4 Tubs, wash, G. I.
- 2 Cans, water, with faucet.
- 2 Hypodermoclysis, sets.
- 6 Hypodermic syringes.
- 6 Basins, wash.
- 6 Irrigators.
- 2 Instrument cases, pocket.

The success of this measure has been already confirmed with the emergency hospitals established for eradication of cholera in Hagonoy, Bulacan, in the year 1916, and in Tayabas, Pangasinan, and other provinces during 1918 and 1919, this indubitably being due to the fact that with emergency hospitals the spread of epidemics by contacts, which is the chief source of propagation of diseases in the Philippines, is prevented and also the focus of infection is reduced to only one.

6. *Quarantine.*—Quarantine consists in the isolation of the sick, and, in many cases, also of contacts either by confining in special places or by putting the house or premises of the patient and his family under guard, not allowing any person to go in or come out, except those hereinafter specified.

Dr. Gardner admitted three degrees of quarantine, viz.: (a) severe quarantine; (b) strict quarantine (c) modified quarantine.

(a) *Severe quarantine*.—The most severe is the permanent segregation in colonies as the Culion Leper Colony.

(b) *Strict quarantine*.—It is the quarantine of vessels and premises in which no one but the attending physicians, the health authorities and the undertaker (should his services become necessary) are allowed to enter the house or premises. Food and other supplies must be deposited at the quarantine limits. Neither persons nor things must be allowed to pass out of the quarantine limits without disinfection by the health officer or the sanitary inspector in charge.

(c) *Modified quarantine*.—In this degree of quarantine the wage earners of the family are allowed to enter and leave the house so long as isolation of the patient is indicated, provided that their work is not such as to make this course dangerous. This privilege should not be accorded to a person engaged in the preparation, care or sale of food, especially milk, nor to a school teacher and only so long as the latter measures of precautions are faithfully observed.

7. *General precautions in quarantine*: (a) *Signals*.—Placards or flags should be put in the quarantined places as a signal that in such places are lodged cases of communicable diseases.

(b) *Personal protection*.—Persons who will be allowed to enter a quarantined room or house must have in an uninfected room or outhouse an uninfected or disinfected suit of outer clothing. Before leaving, such persons must remove their outer clothing worn around the infected house, wash their faces, hands, arms, and scalps with soap and water, and then with a disinfecting solution, after which they put on their clean outer clothing and may then go out. A change of shoes is not necessary, provided they are thoroughly wiped with an antiseptic before beginning to change clothing.

(c) *Articles*.—Thermometers, instruments and other articles used in the sick room must be washed with an antiseptic solution.

(d) *Contacts and convalescents*.—The methods mentioned in (b) must also be used with contacts, convalescents and immunes released from quarantine.

(e) *Pets*.—Dogs, cats, chickens, birds, or other pets must not on any account be allowed to remain in a quarantined house. Their hair, fur or feathers make them excellent carriers of infection from house to house. Before being excluded from the house such animals must be disinfected.

(f) *Vermi*.—Since rats and mice are more than suspected of being active agents in the spread of disease, a determinate effort should be made to rid the premises of them by poison and traps.

So far as possible the house must be rid not only of flies and mosquitoes, but also of cockroaches and bedbugs. Insects play an important part in the spread of communicable diseases and their extermination will be a good measure towards closing every avenue which may permit the spread of infection.

8. *Maps*.—Every health officer should be provided with a map of his district on as large a scale as possible. On these maps the health officers must note the places infected and the location of public-assembly buildings. Small numbered and dated paper flags or colored pins may be used for this purpose, noting also on the map the key giving the signification of the colored pins or flags.

Maps so prepared and kept posted up-to-date indicate not only the march of the epidemic but also facilitate the inspection work and therefore the assignation of the sanitary personnel. In short, without epidemic maps the labor of health officers cannot be efficient.

9. *Disinfection*.—As soon as a case of communicable disease is reported, the house of the patient must be disinfected and it will also be advantageous in the case of certain communicable diseases to extend the disinfection to neighboring houses and sometimes to a whole block of houses.

Disinfection of an infected house and of all articles supposed to be susceptible to, or have been infected or carry infection, must be carefully carried out.

As to the effectiveness of a terminal disinfection after the case has been removed either by recovery or death, still under discussion, the committee on communicable diseases of the American Public Health Association in 1912 established that "terminal room disinfection," as at present practiced by the average board of health has little effect in controlling the spread of infection and that it appears, in so far as figures are available, that the percentage of returned cases is practically the same in those communities where disinfection is compulsory as in those where it is not required.

The whole question of terminal room disinfection is at present under study by a special committee of the American Public Health Association.

Our opinion is that, in view of the local health conditions and health education of the people, terminal disinfection must be compulsory in the Philippines.

Care of dead bodies.—Our opinion with regard to the care of dead bodies concurs completely with that sustained by McNutt which reads as follows:

Bodies of persons dead of communicable disease are traditionally sources of infection. This was perhaps due to a false belief in air infection. From what is now known it is evident that a body enclosed in a coffin, especially when embalmed with the powerful germicides ordinarily used by embalmers (of which formalin is the usual basis), is not a source of infection. We know that it is the living, not the dead, who spreads disease. Public funerals after death from certain communicable diseases are frequently forbidden, but the only apparent benefit lies in thus discouraging the association of well persons with the carriers who may exist in the household.

10. *Immunization*.—Immunization must be used whenever it may be possible to do so as a measure to prevent the spread of communicable diseases. At present we are favorably disposed to the use of vaccines or serums for the following communicable diseases: smallpox, typhoid and paratyphoid fever; rabies; tetanus; diphtheria; pneumonia; staphylocosis; streptocosis; anthrax; pertussis; gonocosis; dysentery; cerebrospinal meningitis; cholera; and plague. Some of these may also be used for the contacts. Vaccines and serums for some are curatives and for others preventives or immunizants.

11. *Supervision of carriers*.—The supervision of carriers is a difficult matter but now duly recognized as a duty of health authorities. In overlooked mild cases of disease and in carriers we may find in all probability the explanation of most outbreaks of epidemics.

McNutt considered two kinds of carriers: "(a) those existing in the general population and giving no history of having been in contact with a sick person; such are usually carriers of germs of little or no virulence; (b) those who have had the disease or who have been in recent association with cases; these are the chief carriers of virulent germs and the class most to be watched by the health officer."

All carriers, insofar as it is possible, should be treated as positive cases. In cases in which it is practically impossible to closely restrain the carriers it seems best to avoid in some manner the danger of infecting other persons by instructing them as to habitual and scrupulous cleanliness of the hands, and to maintain a sufficient degree of surveillance over their movements to see that they do not engage in handling foodstuffs or otherwise spread the disease.

It is of the greatest importance that health authorities be constantly on the lookout for carrier cases of the diseases of which bacteriological methods are available. It is also to be remembered that physicians sometimes fail to report mild cases, and that it is now understood that such cases and carriers are

the ones that play the most important role in spreading diseases and therefore are the ones that need the most effective control.

12. Cleanliness.—Cleanliness is based on the old theory of decomposition. The old sanitarians believed that all pestilential diseases sprang from filth, and they naturally preached the most scrupulous and most conscientious private and public cleanliness. Their belief was wrong but their teaching was all right. The installation of sewer systems, paving and cleaning of streets, plazas, public places and premises are still very necessary in cities and towns, not that the odors arising from dirty streets or back-yard toilets give rise to communicable diseases, but they indirectly lower the vitality of the people, diminish their reserve force and rob them of their immunity against communicable diseases, because it cannot be denied that bad odors cause the closing of windows and the exclusion of fresh air. Bad odors and dirt attract flies and other insects and animals which are at present recognized as germ-carriers; on the other hand, dust may also harbor those microorganisms which resist dryness. In short, the experience of all nations for thousands of years testifies to the fact that filth and uncleanliness are invariably followed by epidemics and unduly high death rates. The value of personal cleanliness is not emphasized here because it is well known to the health officers. If cleanliness in this sense were maintained by all persons certain communicable diseases would be practically wiped out.

13. Regulations.—Since it is impossible for a legislature to foresee every emergency which may arise and the municipal councils sometimes fail to adopt sanitary ordinances for the control of epidemics the health officers may, by virtue of the power conferred upon them by the Administrative Code, prescribe such orders or regulations, approved by the Director of Health and the Secretary of the Department concerned, as they may deem best for the public interest.

The by-laws, regulations or orders so issued shall be widely distributed not only among the people but also to the provincial and municipal authorities, justices of the peace and courts of first instance, municipal and Insular police, and the infractors prosecuted in accordance with the provisions of section 2697 of the Administrative Code of 1917.

14. Education.—Prosecution of infractors for noncompliance with sanitary laws and regulations may stop an epidemic, but there will always remain in the minds of not only the persons prosecuted but also in the minds of their relatives and

friends as well as in the minds of other persons, a certain degree of abhorrence and animadversion against the health authorities.

Dr. Friederich makes the following statement with regard to education of the people in sanitary matters :

True progress in sanitation is only possible when people are shown the need of it. After they understand the measures which we advocate, and see the benefits which they derive from them, they all become coworkers, and active supporters of the Board of Health. They begin to clamor for an active health department. They demand a vigorous enforcement of all sanitary regulations, announce to us existing nuisances, breaks of quarantine or communicable diseases of which we have no knowledge. But far more important it is that an enlightened public will uphold its Board of Health financially. No large measures of sanitation are possible except where the public understand their purpose and appreciate their value. Therefore, the people must be instructed in every phase of modern sanitation. I hold that in every instance, they ought to be told the exact truth. They ought to know just where we are standing. This is the reason why I wished to point out to you the diseases against which we are powerless, the conditions which we cannot change and the measures which frequently are ineffective. It will not do for us to try to mystify the people. They ought to know the full truth. It will not do for us to find reasons and excuses, when we fail to check an epidemic. There are instances where it is not in our power to do it, and we ought to say so in full frankness.

Modern sanitation has done a world of good. It has diminished the number of diseases and shortened the death rate in all parts of the civilized world. It has lengthened life and made it more enjoyable, by decreasing physical suffering and mental grief. We know today what we can do and are positive of our power. Therefore we do not need to be ashamed to confess the spots wherein we are weak.

Lectures, exhibitions, motion pictures, the press, printed matter, contests, pictures, etc., should be used by the health officers on all occasions and places for impressing on the mind of the people the necessity for good public sanitation.

PART II.

COMMUNICABLE DISEASES.

15. The diseases that are most important from the standpoint of public health are those classified as dangerous communicable diseases.

16. Communicable diseases are those which may be communicated from one person to another, or from an animal to man in various ways.

17. Communicable diseases are caused by definite and specific organisms. Cases of such diseases never arise spontaneously; the causative organism derived from a previous case of the same disease must always be present.

18. The classification of communicable diseases adopted by Rosenau is the following:

(a) Diseases spread largely through secretions or discharges from the nose, throat and mouth.

(b) Disease spread largely through excreta.

(c) Diseases spread by insects and vermin.

(d) Diseases having specific or special preventive measures.

(e) Miscellaneous diseases.

19. The communicable diseases may be transmitted by the following ways:

(a) *Contact*.—Consists in the transference of infectious matter from person to person. The contact may be immediate or mediate. Immediate contact consists of the direct transference of infection from the sick to the well. Mediate contact presupposes a third person or an object serving as a link between the sick and the well. The fingers occupy the first place and "droplet infection" the second in the transmission of the diseases by contact.

(b) *Fomites*.—Transmission by fomites is a form of mediate contact in which the objects retain infection for some time and then transmit it to the person. A few years ago fomites was supposed to be one of the most important modes of infection but with the exception of those diseases due to spore-forming bacteria, it is now well understood that fomites rarely convey infection.

(c) *Food and drink*.—Food and drink readily act as vehicles of infection. Many serious epidemics have been traced to infection by food and drink and especially by milk and water.

(d) *Air*.—Air was formerly considered a chief vehicle of infection but now, like fomites, it is regarded as of far less importance than it has been held by tradition. Measles, tuberculosis, diphtheria, pneumonia and pneumonic plague may possibly be spread by means of dust or particles of infected material being sprayed into the air by coughing and spitting, or, as smallpox and chicken-pox, probably by means of tiny particles of skin in the form of scales being blown about in the atmosphere.

(e) *Insects*.—It is well-known that several diseases, such as malarial fever, yellow fever, filariasis, etc., are transmitted by the bites of insects.

(f) *Special modes*.—Rabies is transmitted directly by the bite of the rabid dog or other animal; anthrax is most often transmitted from cattle to man through infection of skin lesions by the bacteria in hides; and hookworm is usually contracted through contact of bare feet or hands with polluted soil.

20. The continuance and spread of a number of the communicable diseases are due to the following classes of infected persons:

- (a) Carriers (no symptoms).
- (b) Unrecognized (missed) cases (mild or atypical symptoms).
- (c) Incipient but infective cases (undeveloped symptoms).
- (d) Recognized (reported) cases.
- (e) Cases of the minor infections recognized by the family or physician but not reported.

21. The Manila ordinances include the following diseases as communicable and require that all of these diseases be reported to the Philippine Health Service: Cholera; smallpox; chickenpox; plague; diphtheria, including membranous croup; filariasis; ship or typhus fever; typhoid or enteric fever; spotted, relapsing, yellow, and scarlet fever; measles; glanders; leprosy; actinomycosis; cerebro-spinal meningitis; tuberculosis; and anthrax. Subsequent additions to the list of reportable diseases included the following: beriberi, purulent conjunctivitis, dengue, epidemic poliomyelitis, influenza, malaria, pertussis, trachoma, paratyphoid fever A and B, and venereal diseases (professional).

PART III.

ARTICLE 1.

DISEASES SPREAD LARGEY THROUGH SECRETIONS OR DISCHARGES FROM NOSE, THROAT OR MOUTH.

DIPHTHERIA.

22. Diphtheria is a specific local infection of the mucous membranes of the throat or nose or both, caused by the bacillus diphtheriae, also known as the Klebs Loeffler bacillus.

The least period of incubation is unknown. The greatest is seven days, average two days.

Quarantine period.—Until two negative results of bacteriological examination.

Infective period.—Before the beginning of symptoms; for the whole period of illness; and until microscopical diagnosis is negative.

Sources of infection.—(1) From a previous case, incipient missed, acute or convalescent. (2) From diphtheria carriers. (3) From fomites. (4) From immediate contact (a person who has been in contact with a diphtheria patient, but who has not himself contracted the disease). (5) From domestic animals. (6) From milk and other food and drink by human infection.

Incidence.—Diphtheria is chiefly a disease of childhood, the great majority of cases occurring among infants and children of school age.

Control.—The following sanitary measures should be taken against diphtheria epidemics.

First. Provide ready facilities for free bacteriological diagnosis if that is available.

Second. Furnish a high-grade antitoxin at cost (free to indigent cases) for prophylactic as well as for curative purposes.

Third. Isolation or hospitalization of known cases and so far as practicable carriers, insisting upon proper disinfection of the infectious discharges.

Fourth. Take specimens from members of the family and others within the sphere of association of the patient, and then isolate or hospitalize those who show the presence of the germs.

Fifth. Whenever there is an outbreak of diphtheria among the children of a certain school, the throat (and in suspicious

cases, also the nasal cavities) of every pupil, teachers and other persons of the same room or grade in such school, should be examined both by inspection to note the condition of the throat and by bacteriological examination.

Sixth. Those with a "sore" throat should be sent home immediately and should not be permitted to return to school until proved by bacteriological examination not (or no longer) to be diphtheria carriers, or in case the bacilli persists in remaining after a thorough attempt at removing them, the patient should remain isolated until it is proved that the bacilli are not virulent.

Seventh. Those who have no sore throat may remain in school until (and unless) the result of the bacteriological examination indicates that they are diphtheria carriers. If such is the case they should remain at home and treated.

Eighth. The contacts shall be immunized by the antitoxin.

Ninth. *As regards school-children.*—On account of the possibility of carriers, children (other than the patient) in infected families should be excluded from school during the quarantine, and should not be readmitted until one negative or nonvirulent culture from nose and throat has been obtained from each child in the family.

Tenth. Schick test.

23. In the city of Manila the following instructions govern the actions of health officers with reference to diphtheric sanitary measures:

1. If the condition is suspicious of being diphtheria, swabs shall be taken immediately from the throat and sent to the Bureau of Science for examination. If the bacteriological report is positive, the case shall immediately be sent to San Lazaro.

2. Immediately upon finding a case positive for diphtheria, swabbings shall be taken from the throat of all contacts and sent to the Bureau of Science for examination. If the report upon any contact comes back positive, that contact shall be sent to San Lazaro for isolation. Where the results of bacteriological examination in a case of contact are negative, another swabbing from the throat shall be taken five days afterwards.

3. Any contact desirous of receiving a prophylactic dose of antitoxin may be sent to San Lazaro, where the treatment will be given.

4. Persons are to be sent to San Lazaro only when they have diphtheria; when the bacilli have been found in the throats of apparently healthy persons (bacilli carriers), or when they desire to take a prophylactic dose of antitoxin.

5. In every case in which diphtheria is discovered in a child, the school history of such child shall be carefully investigated, and if necessary, cultures taken from the throats of the pupils who have been in the same room with the patient, or other close contacts.

6. Inmates of houses in which a case of diphtheria has been found, even though they are not proven to be bacilli carriers, shall be inspected from time to time until the period of incubation has terminated, or for seven days from the time the house was disinfected.

7. Hereafter, swabs for making cultures will be obtained from the Philippine Health Service. Each swab will be furnished in a sealed, sterile test-tube, without any culture-media. After swabbing the throat the swab must be immediately placed in the sterile test-tube, the cotton plug inserted, and without delay sent to the Bureau of Science where the necessary culture will be made.

In the event that the tubes with culture-media are used, care must be taken thoroughly to spread the material on the swab over the surface of the media. Do not break the surface of the media in any way. Do not allow the swab to touch anything but the throat of the patient and the surface of the culture media. The swab must be thoroughly sterilized before it is discarded.

8. Attention is called to the fact that domestic animals, especially the cat, have been found to harbor diphtheria bacilli in their throats, and, therefore, special investigation along this line is suggested.

9. Immediately after the removal of a case of diphtheria or a bacilli carrier, the room or rooms in which the person has lived shall be disinfected, together with all articles liable to be contaminated by the secretions from the patient's throat or nose.

10. Cases of diphtheria or bacilli carriers shall be held in San Lazaro until four negative bacteriological findings, on separate days, are reported from the Bureau of Science.

11. For every case of diphtheria, and for each bacilli carrier, a blank Bureau of Health form shall be filled out with the information required thereon, and as soon as practicable it shall be transmitted to the Chief, San Lazaro Hospital Division, who will fill in his part and send it to the Philippine Health Service. This form shall be in addition to the Transfer Slip which is now required for each case of dangerous communicable disease. (Cir. J-86 and K-29, P. H. S.)

MEASLES.

24. Measles is an acute, highly communicable disease, characterized by fever, skin eruption and inflammation of the mucous membranes of the eyes, nose and respiratory passages. (In the Philippine Islands it is usually not severe and terminates without complications). The fatality is greatest in infants and young children.

The specific cause of this disease is unknown but recent experiments have demonstrated that the virus is filtrable through porcelain bougies and is contained in the blood.

Incubation period.—From exposure to infection to onset of illness: Least, 4 days; average, 9 to 10 days; greatest, 14 days. From exposure to infection or appearance of rash: Least, 7 days; average, 14 days; greatest, 18 days.

Quarantine period.—For contacts, 18 days; for the sick at least that length of time, and as much longer as the subsidence of the catarrhal conditions. After release from quarantine the child should not be allowed to reenter school for at least 5 days longer. Minimum period of isolation should be until ten days after the appearance of the rash and until all discharges from the nose, ears and throat have disappeared and until the cough has ceased.

Infective period.—From earliest appearance of symptoms till convalescence is well-established. The catarrhal stage preceding the eruption is very infectious. The blood is infective only just before and for about 24 hours after the appearance of the eruption. Mixed nasal and buccal secretions are infective for about 48 hours from the time of the eruption.

Transmission.—(1) Direct contact with a previous case. (2) By contact with the secretions of the nose, throat and respiratory passages including droplets. (3) The scales from desquamating cases are not infectious. (4) Fomites infections are very rare.

Rosenau states that after two weeks following termination of quarantine there is practically no danger of contracting the disease from the room in which the patient has been treated even without disinfection.

Incidence.—Measles is a disease of infancy and childhood, like diphtheria.

Control.—(a) When measles is present in a community all children showing catarrhal symptoms even though they have as yet developed no rash, should be kept from school and isolated.

(b) Children suffering from measles should be sent to the hospital or, if there is no hospital, should be kept away from

school and isolated in the house, care being taken to prevent them from taking cold.

(c) Children in the infected family may be allowed to continue at school for 8 or 10 days after exposure to contact, then excluded for a week to 10 days, after which time those who do not develop the disease may be allowed to return to school.

(d) Medical inspection of all private and public schools shall be made in a locality in which measles is epidemic.

25. Sanitary measures against measles in the city of Manila.—

1. Cases of measles found at private residences may be isolated there and not sent to the San Lazaro Hospital, provided that request for permission so to isolate the patient is made by the physician in attendance upon the case, this physician is to be held responsible that the quarantine will be faithfully maintained. Such quarantine shall be under the supervision of the Director of Health or of his authorized representative.

2. The preceding regulation will not apply to the following cases:

(a) Where no physician is in attendance;

(b) Where no cases of measles occur in hotels, tenement houses, boarding houses, colleges and schools, dormitories, or other institutions or private houses the number of occupants of which exceeds 10.

Provided, That cases of measles may be permitted to be isolated in colleges or schools with intern pupils, provided that in the opinion of the Director of Health or his authorized representative such institution is equipped with a hospital or infirmary which guarantees the maintenance of an efficient isolation.

3. Any question arising with regard to the practicability of isolation in private houses, as well as the diagnosis of the disease in doubtful cases, shall be submitted to the Director of Health or his authorized representative, whose decision in the matter shall be final.

4. Any house in which a case of measles is isolated by authority of the Director of Health shall bear a placard printed in large type and so placed to be readily visible from the street, announcing that a case of measles is quarantined therein. This placard will be furnished by the Philippine Health Service, and shall not be removed nor any portion thereof erased or altered except by the Director of Health or his authorized representative.

5. Due to the association, frequency encountered, of measles and diphtheria, swabs will be taken by the Philippine Health Service from the throats of all cases of measles.

6. Should the examination of the swab by the Bureau of Science establish the fact that the patient is a carrier of diphtheria bacillus, the patient must be transferred to the San Lazaro Hospital immediately for isolation and treatment, and the physician in attendance will be notified promptly of the action taken.

7. It shall be the duty of the physician in attendance upon a case of measles authorized for isolation in a private residence to notify the Director of Health of the termination of the period of isolation, which, however, shall not be regarded as finally terminated until the premises have been disinfected by the disinfecting personnel of the Philippine Health Service in the manner and that at the time designated by the Director of Health or by his authorized representative. (Cir. O-21, P. H. S.)

26. *German measles*.—Also called rubeola, rubella, rothelm, resembles measles in symptoms and transmission, but is a distinct disease and of less importance. It may be made subject to sanitary measures similar to those indicated for measles.

SCARLET FEVER

27. Scarlet fever (scarlatina) is an acute febrile infection characterized by sore throat and a diffuse eruption which appears during the first day or two of the fever. The specific germ of the disease is as yet unknown. Streptococci (S. anginosus) seem to be the most probable cause.

Incubation period.—Least, less than 24 hours; average, 1 to 3 days; greatest, 7 days.

Quarantine period.—Seven days from last exposure. Twelve days for contacts. For the convalescents until desquamation is absolutely complete and the discharges from the nose, ears and throat, or suppurating glands have ceased. The child should be excluded from school no longer than 8 weeks and should under no circumstances return to school under 5 weeks.

Infective period.—From earliest appearance of symptoms till all desquamation has ceased.

Transmission.—(1) From a previous case of scarlet fever, acute or convalescent. (2) From a case of sore throat without discernible rash but merely a mild form of the disease. (3) From the secretions of the mucous membranes of the nose, throat and respiratory tract and secretions of the ears. (4) From milk, either by human infection of the milk in cowsheds and dairies, or during the milking. (5) From food in like ways. (6) From carriers. (7) The desquamation (scales) plays little or no part in infection. The same occur by vomites.

Incidence.—Scarlet fever, like diphtheria, is a childhood disease, the great majority of cases occurring under fifteen years of age.

Control.—(a) Known cases should be isolated or hospitalized and discharges from nose and mouth disinfected.

(b) An effort should be made to detect mild and atypical cases within the radius of a given focus of infection.

(c) Medical school inspection helps in locating such cases and excluding them from the school.

(d) Children in the infected family should be excluded from the school until the expiration of one week after the termination of isolation. If, however, the case goes to the isolation hospital or the well children leave home, they may if free from symptoms, return to school one week later.

WHOOPING COUGH.

28. Whooping cough (pertussis) is a specific affection characterized by catarrh of the respiratory passages and a series of convulsive coughs, caused by the bacilli discovered by Bordet and Gengon.

Incubation period.—Least, 7 days; average, not determined. For practical purposes of prevention 14 days will cover most cases.

Patient should not be released from quarantine until one week after the spasmodic stage is over or until 6 weeks have elapsed since the onset of symptoms.

Infective period.—The whole period of illness from onset to earliest catarrhal symptoms, during convalescence, and ever after the subsidence of the characteristic cough.

Transmission.—(1) Directly from person to person. (2) From the secretion of the nose, throat, mouth, and respiratory tract. (3) From handkerchiefs, toys, drinking cups, roller towels, and another fomites contaminated with the infective secretions. (4) Domestic animals especially dogs and cats.

Incidence.—Pertussis is a childhood disease. The great majority of the fatal cases occur under 5 years of age.

Immunity.—One attack usually protects.

Control.—(a) Whooping-cough should be reported and the patient isolated, but the isolation need not include strict confinement to a room. (b) Provided that the patient does not come in contact with other children or handle articles which may be handled or eaten by them. (c) School need not be closed but daily inspection of pupils should be performed. (d) Well children in the family need not be excluded from school unless they have a suspicious cough. (e) Dogs, cats, and other

domestic animals should be kept away from the patient. (f) Terminal disinfection of the room is not necessary but the fomites should be boiled or saturated with a strong germicidal solution. (g) A vaccine (pertussin) may be used for both curative and prophylactic purposes.

EPIDEMIC PAROTITIS.

29. Epidemic parotitis, also called mumps is a specific infectious disease, whose cause is unknown which attacks the salivary glands and may be complicated by other glandular inflammations particularly of the testes.

Incubation period.—Least 14 days; greatest 25 days. For public health purposes the maximum period of incubation is 21 days.

Quarantine period.—Twenty-five days from last exposure to infection. The patients until two weeks after the appearance of the disease and one week after the disappearance of the swelling.

Infective period.—From onset of prodromal stage and for sometime, even six weeks after symptoms have disappeared. The chance of infection diminishes progressively from the onset of the disease.

Transmission.—(1) By direct contact. (2) Rarely by indirect contact or by a third person. (3) It is not air-borne. (4) The virus is contained in the secretions from the mouth and perhaps the nose. (5) Probably by droplet infection.

Martha Wollstein has shown that the salivary secretion in mumps contains a virus which when filtered and injected into the parotid glands and testicles of cats, causes pathological changes resembling mumps in human beings.

Incidence.—Mumps usually occurs between the ages of 5 to 15 years.

Immunity.—Hess injected 6 to 8 cc. of blood of convalescents intramuscularly into 17 children. None of these children developed mumps.

Control.—(a) Children having mumps should be excluded from school. (b) In institutions all persons attacked should be promptly isolated.

GRIPPE.

30. Grippe, also called influenza, and trancazo is a specific pandemic disease, appearing at irregular intervals, characterized by rapid spread and a high percentage of incidence wherever it occurs.

The specific cause of the disease is the bacillus influenza which was described by Pfeiffer in 1892 and 1893. The disease may

appear under four forms or types: respiratory; nervous; gastrointestinal and febrile.

Incubation period.—Least, less than 24 hours; average 2 to 4 days; greatest 5 days.

Quarantine period.—Five days from last exposure to infection, but impracticable.

Infective period.—From earliest symptoms till convalescence is well established.

Transmission.—(1) From person to person. (2) By fomites: handkerchiefs, towels, cups, and other objects contaminated with the fresh secretions. (3) By carriers: from nose, throat and respiratory passages.

Incidence.—Influenza is a disease of all ages.

Immunity.—Immunity is slight and an attack thereof does not usually confer it.

Control.—(a) Compulsory reporting. (b) *Isolation.*—The isolation of patients suffering from influenza should be practiced.

(c) *Placarding.*—In cases of unreasonable carelessness and disregard of the public interests placarding should be enforced.

(d) *Hospitalization* if possible. (e) The aged and feeble should be kept so far as possible from possible sources of infection.

(f) If the disease invades institutions, the sick, suspects and carriers should be isolated as soon as the first symptoms are seen. (g) Vomits and bodily discharges, especially those from nose and throat should be disinfected for preventing droplet infection. (h) Prohibition of use of common cups and improperly washed glasses at public drinking places. (i) The attendant of the cases should wear a gauze mask. (j) During epidemics, persons should avoid crowded assemblages, street cars, and the like. (k) Education as regards the danger of promiscuous coughing and spitting. (l) Patients, because of the tendency to the development of broncho-pneumonia, should be treated in well-ventilated, warm rooms. (m) *Immunization and vaccines.*—In the last epidemic vaccines have been used in the United States and Europe to accomplish: First, the prevention or mitigation of influenza *per se*; second, the prevention or mitigation of complications recognized as due to the influenza bacillus or to various strains of streptococci and pneumococci.

(n) Terminal disinfection for influenza has no advantage over cleaning, sunning and airing.

LOBAR PNEUMONIA.

31. Pneumonia is a specific disease caused by the pneumococcus of Fraenkel. Many different infections are caused by the

pneumonococcus, but in the lobar pneumonia the disease is characterized by the massive involvement of one or more lobes of the lungs.

Incubation period.—The least period is unknown. Average two to five days.

Quarantine period.—Until two negative results in the bacteriological examinations—blood and agglutinoreaction of the bronchial secretions.

Infective period.—Before appearance of symptoms, during the period of illness and until biological reactions are negative. The specific germs may live for months in dried sputum, in which it also maintains its virulence.

Transmission.—(1) From a previous case: Incipient, missed, acute, convalescent or in apparently healthy condition. (2) By carriers. (3) By fresh discharges of the lungs. (4) By fomites. (5) By the dust if it conveys dry sputum with pneumococcus.

Incidence.—The mortality from pneumonia is distributed evenly amongst all ages. The infants pay great tribute to this disease.

Immunity.—The immunity lasts only a few weeks. The anti-pneumonic vaccination may prolong the time of immunity for some months.

Control.—(a) Cases of pneumonia should be regarded as foci for the spread of infection and should be isolated. (b) Detection of carriers and subject discharges to disinfection. (c) Control over convalescents who may carry virulent organisms in their respiratory passages for weeks or even months. (d) The discharges from the nose and throat should be burned or disinfected. (e) Fomites contaminated by patients should be boiled or disinfected. (f) Avoid danger of promiscuous spitting and drying of spit.

TUBERCULOSIS.

32. Tuberculosis is an infective disease caused by the bacillus tuberculosis. The tubercle bacillus exists in several different types, the most important of which is the *human* type. The *bovine* type may also infect man through the medium of milk. The bacillus may invade any part of the body, hence the various forms of tuberculosis.

Incubation.—Unknown.

Quarantine period.—During the whole course of the disease in the “open form” and until the disappearance of the bacillus, verified by bacteriological and biological analysis in the “closed form.”

Infective period.—During the whole course of open form.

Transmission. (1) *Congenital.*—Excessively rare. (2) *Inoculation.* This mode is possible but rare; produces either local lesions, or infection of lymphatics. (3) *Inhalation.*—Inhalation of dried dust containing bacilli or inhalation of droplets thrown off in coughing, sneezing or speaking. (4) *Ingestion.*—The bacilli are frequently swallowed in food prepared or handled by the tubercular, in milk which is either from tubercular cows or infected by human carriers, and perhaps through putting one's own fingers into the mouth after they have been infected from some source. (3) *Contact.*—It is believed that "house infection" may take place in well persons from apartments previously infected, from fomites such as handkerchiefs, towels, cups, etc., etc., used by a tuberculous.

Incidence.—Tuberculosis affects persons in the prime of life. The development of the infection depends upon two contrary factors: the amount of infection and the vital resistance. Depression of vital resistance may permit the development of the latent infection which apparently exists in almost all persons. City life favors tuberculosis, also under-nutrition, overwork, lack of ventilation in farm houses, overcrowding, etc.

Control.—The prophylaxis of tuberculosis may be summarized under two points: First, in avoiding infection, and second, in maintaining an increasing vital resistance.

(a) Precocious diagnosis of cases by official facilities for bacteriological and biological diagnosis. (b) Registration of cases with a complete record of all known cases of tuberculosis in any of its manifestations. (c) Home supervision, if it is possible, to give instruction to the patients on preventive measures. (d) Improved housing, with due regard to ventilation, overcrowding, cleaning, etc. (e) Antispitting ordinances. (f) Establishment of clinics, dispensaries, sanatoria and hospitals for the tuberculous. (g) Educational measures by means of publicity. (h) Sanitary supervision of the dwelling houses, particularly tenements, factories, schools, etc. (i) Protection of children in the families of consumptives. (j) *Disinfection.*—After the death or removal of a tuberculosis patient, the room or rooms which have been occupied by him require attention. The following processes should, so far as required, be applied to infected rooms: (1) Cleaning-up, involving scrubbing of floors and woodwork, removal of dust by moist methods, or vacuum, and airing. (2) application of simple disinfectants, such as crude carbolic or coal-tars in known strength, to surfaces which have been exposed to infection by handling, etc.; appropriate disinfection (or destruction) of miscellaneous articles which have been exposed

to infection; similar treatment for bedding. (3) Formaldehyde fumigation, for disinfection of carpets, fabrics and surfaces not susceptible to treatment under above heads. (4) Carpets, bedding, curtains and other furnishings or articles that become infected with tubercle bacilli, if of little value, may be destroyed.

(k) The following rules should be left in writing with the tubercular patients:

(1) Always keep up your courage and strive to live. Obey orders, for your recovery will depend upon your strict compliance with all instructions given.

(2) Keep in mind that tuberculosis can in many cases be cured and may in every case be avoided.

(3) If your illness is so far advanced that your recovery is not possible, console yourself with the thought that by your example your immediate family and relations will avoid catching the disease.

(4) Try not to cough, except when you are obliged to expectorate. Coughing can often be prevented by force of will. When you cough or sneeze cover your mouth with paper napkin so as not to scatter saliva around you.

(5) Never swallow your saliva.

(6) Be very careful not to spit on the floor, because the saliva may contain microbes dangerous to yourself and to the person living with you. Saliva dries on the floor and mixes with the dust of living rooms or of the street, and if you inhale this dust you are likely to become a consumptive or to aggravate your illness.

(7) When at home or at work always spit in a vessel half full of a solution of lysol or carbolized water (5 per cent).

(8) Clean the spittoon every night by placing it in a pan of boiling water for several minutes; or, if you can not do this, throw its contents into the water-closet. Do the same with all vessels into which you spit and wash them afterwards with a little lysol.

(9) Don't spit upon your pocket handkerchief; but if you are obliged to do so, boil them daily.

(10) When you cannot carry your spittoon with you, spit into a paper napkin.

(11) Always wipe your mouth with a paper napkin after spitting and be careful not to contaminate your hands with the saliva.

(12) Carry a paper bag in your pocket to hold the napkins that have been used.

(13) When you have used a napkin either for spitting or for

wiping your mouth, fold it up carefully and put it in your paper bag.

(14) Every night before retiring burn your paper bag with the napkins in it.

(15) Don't let your saliva soil your clothing, lips, hands, sheets, pillows, rugs, furniture, or any other thing within your reach.

(16) Should you carelessly spit on anything other than in your spittoon or on your paper napkin, destroy the sputum immediately, either by burning it or by sprinkling limewater or some other disinfectant on it.

(17) Avoid handshaking and kissing; both customs are dangerous to you and to other persons. They are likely to communicate tuberculosis, and kissing may give you colds and influenza which would complicate your disease and delay your recovery.

(18) Avoid every kind of fatigue, bodily or mental. The least weariness may change the course of your illness by converting it from curable to incurable.

(19) If you do not want to become a consumptive do not neglect to have any affection of the chest, however slight, treated immediately.

(20) Wash your hands and face (especially your lips) with soap and water many times a day, particularly before eating and drinking.

(21) Wash your mouth with water to which a little liquid cresolis compositus has been added, and brush your teeth in the morning upon arising and at night before retiring.

(22) Avoid draughts and dampness, and keep away from dusty places.

(23) Never allow your room to be swept when it is dry. Before sweeping, the floor should be dampened to keep the dust from rising.

(24) Never sleep in the same bed with another person; and, if possible, not even in the same room.

(25) Always sleep with your windows wide open, and cover the body up well in order not to feel cold. Do not sleep with the face covered.

(26) Rest frequently during the day and try to lie down on a bed or sofa for several hours in front of an open window.

(27) Walk in the sunshine, but with your head covered. Frequent walks in good weather are very beneficial, but avoid going out when the wind is raising the dust or it is raining.

(28) In the morning wash your chest with cold water and follow it up with a good rub.

(29) Eat as much meat as you can, especially rare beef. Raw meat may be eaten only when fresh; in any other condition it may cause bowel trouble.

(30) Drink plenty of milk, even with meals.

(31) Eat several meals a day; at least four, if possible.

(32) Milk, raw eggs, and rare fresh beef are among the most nourishing foods.

(33) Do not drink liquor. Gin and all other liquors will injure your stomach, destroy your strength, and prevent a cure of tuberculosis.

(34) If you want to be cured and live for the sake of your family, drink absolutely no liquor.

(35) Beer in small quantities will not hurt you; but be very careful not to drink more than a liter a day.

(36) Go to bed early every night. Do not go to places where tobacco smoke and dust may make you cough and tire you out.

(37) Do not smoke.

(38) Amuse yourself with household games with your children or friends. Read, and try to avoid all worry, anger, and annoyance.

(39) By following these directions, you will probably recover.

(40) Whenever you need advice come to a dispensary of the Antituberculosis Society, where you will be told exactly what you should do.

(41) No careful and cleanly consumptive, properly instructed regarding prevention and treatment of his disease, can be a source of danger to the persons around him.

CEREBRO-SPINAL FEVER.

33. Cerebro-spinal fever also called "epidemic cerebro-spinal meningitis" is an infection by the *Diplococcus intracellularis meningitidis of Weichselbaum* which attacks the meninges of the brain and spinal cord.

Incubation period.—The least period of incubation is unknown, probably about 3 days. The greatest is 14 days. Average, 7 days.

Quarantine period.—From exposure to infection until two negative results in the bacteriological examination.

Infective period.—Before the beginning of the symptoms, for the whole period of illness and until disappearance of the micro-organisms in the secretions.

Transmission.—(1) From a previous case, incipient, missed, acute or convalescent. Single cases in sporadic outbreaks and groups of cases in epidemics. (2) From carriers: Individual convalescent from an attack of cerebro-spinal fever; "contacts"

with a case of the disease and persons who cannot be shown to have had any previous contact with the disease but who are carriers. (3) The nasopharynx is the location in which the meningococcus is most frequently found and is the site affected. Here it flourishes, sometimes in great numbers, and probably is expelled by talking, sneezing, or coughing, or is mixed with the secretions of the nose and implanted by indirect contact, on the mucous membrane of another individual. (4) From fomites infected with fresh discharges and secretions.

Incidence.—Children and young adults are most susceptible.

Immunity.—Immunity is not lasting.

Control.—(a) Provide ready facilities for bacteriological and biological diagnosis. (b) Isolation of known cases. (c) Reporting the suspected cases and isolation until bacteriological disappearance of the meningococcus and disinfection of the sputum and nose discharges. (d) Restrictive control over the chronic carriers and give careful instructions for avoiding spreading the disease to others through their secretions. (e) The carriers must be isolated from contacts with others in quarters, in the mess hall particularly and in gatherings indoors. They should not be hospitalized, but should be kept in the general hygienic measures. (f) Put these carriers under vaccine treatment. (g) When the disease is epidemic people should keep away from large public gatherings, etc., etc. The closing of the schools may, under certain circumstances, be justified.

ARTICLE 2.

DISEASES SPREAD LARGELY THROUGH EXCRETA.

CHOLERA.

34. Asiatic cholera is a specific communicable disease, characterized by vomiting, purging and collapse. The infective agent is the *Spirobacillus comma* of Koch, more commonly called cholera vibrio.

Incubation period.—Least, a few hours; average, 1 to 2 days; greatest, 5 days.

Quarantine period.—Five days from date of last exposure to infection. For carriers until four successive examination at five days' interval show the absence of the cholera vibrio.

Infective period.—From earliest onset of symptoms till complete recovery and during whole time that the patient is as a carrier.

Transmission.—Cholera is spread by man from place to place. (2) The cholera vibrio enters the digestive tract through the mouth. (3) It is taken in the food and drink. (4) Infected

water is a frequent medium of transference. (5) The transference from man to man may be directly and also indirectly by flies, fingers, food, and all the innumerable channels from the annus of one man to the mouth of another. (6) In endemic or residual cholera (as in the Philippines) water-borne infection plays a minor role. (7) The cholera vibrio leaves the body in enormous numbers in the dejecta, also sometimes in the matter vomited. (8) The cholera vibrio by the fact that it does not invade the blood and tissues is not voided in the urine. (9) The cholera vibrio may live and even multiply in water, it matters not what kind of water (foul, rivers, wells, or mains, harbors, canals, sea, ice) contaminated with the discharges of cholera patients. (10) Milk may be contaminated, but is probably not a frequent medium of infection for the reason that its acid reaction is inimical to the cholera vibrio. (11) Green vegetables and fruit that have been washed in an infected water or hands may convey the disease. (12) The bacilli may live in fresh bread, butter and meat for from 6 to 8 days, if not too acid. (13) *Fomites*.—Persons frequently become infected through handling the dejecta or through freshly infected fomites, such as soiled linen, because the bacillus may multiply rapidly upon the surface of moist linen. Bed, floors, walls, toys, etc., contaminated with the dejecta can be regarded as possible sources of infection but the cholera vibrio dies rapidly when dried or exposed to light and other injurious influence. (14) *Flies, etc.*—It has been shown that the cholera vibrios may live in the intestines of flies for at least 3 days and these and other insects may also spread the infection mechanically. (15) *Bacillus carriers*.—The cholera vibrios are passed in the faeces during the early part of the disease. They usually disappear after the fourth to the fourteenth day but may remain a much longer time. Persons in good health may harbor the cholera organism in their intestines. Cholera carriers, therefore, play an important part in the spreading of infection.

Incidence.—Asiatic cholera is a disease of all ages but very rare in childhood under 3 years of age.

Immunity.—Immunity is of short duration. The artificial immunity by the inoculation of a vaccine is done at present in Japan, Servia, and Russia, and in the armies fighting in the Great Satisfactory War, *with results*.

Control.—Preventive measures: In territory menaced by cholera, the following preventive measures must be considered:

1. Establishment of a system of securing and recording information.
2. Organization of available force for sanitary work.

3. Enactment of necessary ordinances.
4. House-to-house inspection.
5. Safe disposal of the faeces of the entire population.
6. Supervisory control of the water supplies.
7. Supervisory control of food and drink and prohibition of certain food-stuffs.
8. Campaign of education.

Suppressive measures.—As suppressive measures, after the appearance of cholera, the following are necessary:

1. Quarantine.
2. Disinfection.
3. Examination of stools.
4. Observation of contacts.

PREVENTIVE MEASURES.

35. *System of securing, recording, and forwarding information.*—Each district health officer should provide himself with the following maps:

Map of the Philippine Islands.

Map of provinces.

Map of municipalities, showing the boundary lines between municipalities and showing all barrios.

The map of the Philippine Islands is to be used by him for keeping track of the extent of infected territory and its proximity to his own district. Infected municipalities should be marked with colored pins, and may also be numbered to indicate priority of infection.

The provincial map is to be used the same way, viz., to follow closely the march of cholera in the provinces.

The municipal maps are the most important, and he will mark thereon the particular barrios which are infected and which must be subjected to general disinfection. The district health officer must never be satisfied to record on his maps an infected municipality within his own province, but he must also know of and record the exact location of the barrios in which the cases occurred.

He shall also keep a daily record of cases and deaths of cholera by municipalities within his province, on a form similar to the following:

Province of Pampanga.

This form can also be used as a part of the monthly report of cholera.

The district health officer is expected to establish prompt communication between the municipal health officers or persons acting as such and his own office. He will be held responsible for the prompt reporting of suspicious cases.

If telephone or telegraph communication exists, it should be employed in reporting cholera cases. If communication by wire is not possible, service by mail or messenger must be established.

Subject to the general rules with regards to telegraphing, he shall report cholera cases and deaths by wire to the central office of the Service daily, using the following form as a model:

HEALTH, Manila:

Cholera: Ambos Camarines, Bao, seventeenth, four, two; eighteenth, six, five; Iriga, seventeenth, nine, four; eighteenth six, one; Albay, Legaspi, sixteenth, seven, six; Bato, sixteenth, one, zero.

He shall make a weekly report by letter of the cholera situation, the disposition of personnel, etc., and forward the same to the Central Office of the Service on Saturday of each week.

He shall make a monthly résumé report by letter, giving the course of the disease, the disposition of personnel, the special measures taken, and all other interesting features.

Organization of the sanitary personnel.—Secure all available personnel for house-to-house inspection; municipal police, municipal and provincial sanitary inspectors, tenientes of barrios, and other employees are usually available.

Divide the municipality into districts; the districts should be of such size as to permit one man to inspect each house and premises once daily in a working day of 8 hours.

Place one inspector, policeman, or volunteer in each district. Place one responsible man, such as an Insular sanitary inspector, Insular assistant sanitary inspector, provincial sanitary inspector, or president of the municipal board of health, in charge of the entire inspection force as chief inspector. He should have transportation to enable him to cover the entire municipality quickly, and he should visit all inspectors in theirs districts and supervise their work daily.

In addition to the inspection personnel, reserve sufficient force to disinfect houses or contacts. The size of this force will depend on the size of the outbreak. Before cholera appears, one or two men trained under the direction of the president of the municipal board of health or the chief inspector, in the elements of disinfection, will usually be sufficient.

The district health officer; one to three experienced sanitary

inspectors to instruct provincial sanitary inspectors in house-to-house inspection and disinfection, and to take charge of general disinfecting parties; a number of provincial sanitary inspectors under instruction, and in reserve for general disinfection or inspection work in the provinces.

One local health officer; one provincial inspector as chief inspector in charge of house-to-house inspection and instruction of municipal sanitary inspectors; a number of municipal sanitary inspectors, for house-to-house inspection; two municipal sanitary inspectors, for disinfection work under the direction of the municipal health officer.

The district health officer will divide the provincial capital into health districts, making of it a model town for demonstrating house-to-house inspection and disinfection to the provincial inspectors.

After instructing a group of provincial inspectors thoroughly he will place these in the municipalities as chief inspectors, and they in turn will instruct the municipal sanitary inspectors in their duties. The district health officers will replace the provincial inspectors sent to the municipalities with others in need of instruction, until all have been instructed. He will then keep a reserve of provincial inspectors for general disinfection work. This procedure will insure two things, a trained provincial personnel and a trained reserve available for immediate duty in the worst infected places.

House-to-house inspection and house disinfection to be performed by municipal sanitary inspectors under the supervision of a provincial sanitary inspector. General disinfection of barrios to be performed by the reserve force of provincial sanitary inspectors under the direction of the district health officer or one of the experienced sanitary inspectors from provincial headquarters.

Enactment of necessary ordinances.—Such ordinances as may be necessary to enforce the foregoing instructions, if not already in force, should be urged upon the municipal council, and any delay or difficulty encountered in securing their enactment should be promptly reported to the Director of Health.

Municipal ordinances should provide for proper disposal of faeces; collection of garbage; sanitary maintenance of premises; proper care of food and drink; and should impose adequate penalties upon violation of the same.

House-to-house inspection.—The object of house-to-house inspection is (1) to detect cases of suspicious illness, and (2) to enforce sanitary maintenance of premises.

Great stress must be laid upon the necessity for courtesy on

the part of inspectors at all times. They must not depend upon their uniforms alone for announcing the purpose of their visits, but they must request permission in every instance in a courteous manner to enter houses or premises.

The inspector should ascertain the number of persons in the house, making a careful note for future use, and should insist upon seeing all of them. He should leave Cholera Circular No. 1 with the head of the family, and should be prepared to explain the contents of the said circular and to answer any questions pertaining thereto. He should pay particular attention to the methods employed for the care of water and food. He should insist that water and food be protected against flies and from contamination through any other source. He should insist upon removal of garbage, refuse, and filth, or any condition which favors the breeding and nourishing of flies. He should always bear in mind that flies are likely to breed in even small collections of manure. The ground surface under and around the house must, whenever practicable, be rendered dry by filling and draining. The throwing of wash water or other wastes in the immediate vicinity of the house must be prohibited and prevented. For the correction of sanitary conditions, he should give verbal orders. If these have not been carried out by the time of his next visit, he should report the matter immediately to the chief inspector for action. If he finds a case of suspicious illness, he should (1) place the house in quarantine; (2) notify by messenger, or any other means available, the local health officer or the chief inspector; (3) upon the arrival of the local health officer or the chief inspector with the quarantine guard, he will resume his house-to-house inspection.

Disposal of feces.—The existence of bacilli carriers renders necessary the safe disposal of the feces of the entire population. Expensive systems of disposal of wastes are out of the question for the average Filipino town. In poor towns, where no sewer or pail system exists, every householder should be required to dig a simple pit closet and to cover each fecal deposit promptly with lime or fresh earth. If the ground is low and the pit fills with water in the rainy season, a disinfecting solution should be furnished to every householder and the inmates of the house required to deposit their dejection in this solution.

Supervisory control of the water supply.—(a) If an artesian well is available in a cholera infected district, water from all other sources should be prohibited.

(b) If the source of water supply is a river or stream and is uninfected, prevent pollution of the stream with human excreta and prohibit the washing of clothes in the stream. If the

stream is infected or if its pollution cannot be prevented, have the water boiled in large tanks and issued under guard, and prohibit the use of unboiled water.

(c) If the source of water supply is surface wells, select the best of these, one in each barrio, close the others, and protect the wells selected from pollution. If no wells can be found which furnish safe potable water, the contents of the well may be rendered safe by the permanganate method, or water can be boiled and issued under guard.

Supervisory control of food and drink.—Irritating and putrifying or fermenting foods should be prohibited and all vegetables or fruits which are eaten raw, except bananas, oranges, and mangoes.

The closest supervision should be exercised over markets, tiendas, restaurants, and any other place where food and drinks are manufactured and sold. Unnecessary handling of food stuffs should be prevented and all food stuffs should be protected from flies and insects. No drink should be allowed to be sold containing water which is neither distilled nor boiled.

Campaign of education.—Every effort should be made to instruct the people in the prevention of cholera, as outlined in Cholera Circular No. 1. The coöperation of the *cura párroco*, of missionaries, and of school teachers should be secured in instructing the people and inculcating habits of cleanliness. Special stress should be laid upon the use of boiled water, freshly cooked food, protection of food and drink from flies, and washing of the hands before eating.

Anticholera vaccine.—Anticholera vaccine has been used with success among the armies in the Balkan War and is also at present used with satisfactory results in Indo-China and Java. It is the desire of the Philippine Health Service to undertake the vaccination against cholera thruout the Islands, especially among contacts and other persons exposed to contagion.

Vaccination will not be made compulsory unless otherwise directed by the Director of Health but it should be practiced as extensively as possible, especially in those places where cholera is endemic, always with a view, however, to constant increased use every year.

The following is an excerpt of the findings of the Service Committee on Anticholera Vaccination:

1. Cholera vaccine produces less reaction than that of typhoid.
2. The second injection appears to produce lesser reaction than the first one.
3. The preparation to be used should be a vaccine, which has

been killed at 60°C for one-half hour and carbolized. It should contain 1,000 millions per 1 c.c.

4. The dose for healthy adults in the Philippines should be 1,000 millions.

5. One injection should be given in case of field vaccination on a large scale. If practicable 2 injections should be given (500-1,000 millions).

Children under 15 years of age should be given one-half the dose indicated for adults. Vaccinated persons should be inspected daily for observation of the sequelae or reactions of the vaccination. They should also be warned as to the nature of the reaction in order to avoid the prejudice of the simple people against the aforesaid vaccination.

The immunity conferred by anticholera vaccination lasts from twelve to eighteen months. This does not mean, however, that immunity is entirely lost at the end of said period, as vaccinated persons may still hold a certain degree of partial immunity which will modify or minimize the intensity of the disease in case of an attack.

Teach the people that the infection of cholera is primarily in fecal matter alone, and that if they properly dispose of their fecal matter, no great spread of the disease is possible.

The instructions given on paragraph forty-one against dysentery shall also apply to cholera.

SUPPRESSIVE MEASURES.

36. *Quarantine*.—The only quarantine necessary in the prevention or suppression of cholera is the quarantine of infected houses. Interbarrio, intermunicipal, and interprovincial quarantines are seldom feasible and are almost invariably ineffective. Such quarantines impose unjustifiable restrictions upon commerce and personal liberty.

House quarantine is the only quarantine which a municipal or district health officer may apply legally without authority from the Secretary of the Interior and the Director of Health.

Quarantine of an infected house should be placed immediately upon discovery of the case, and maintained rigidly until the recovery or death of the patient. Quarantine should include all persons exposed to infection whose clothing, hands, and feet have not been disinfected, or persons living and remaining in the infected house. Contacts who have been released after disinfection should be kept under daily observation for five days and promptly quarantined if they show any symptoms suggestive of cholera.

Disinfection.—Three kinds of disinfection are recognized:

House disinfection.

General disinfection.

Treatment of feces.

House disinfection should include disinfection of contacts desiring to leaves the premises.

As the cases must remain and be cared for in the houses in which they are found, one room is first disinfected, and the patient placed therein with a person acting as nurse. Disinfecting solution is furnished for the treatment of excreta, and instruction in the care of the sick and in self-protection is given to those in attendance on the patient. The rest of the house and its contents are then disinfected by washing or by immersion of the articles in a disinfecting solution. The contacts are disinfected and isolated; they are held under observation for five days, and whenever possible their stools are examined for cholera vibrios.

Ordinarily, in the disinfection of contacts, a thorough washing of the exposed parts of the body and a change of clothing will be sufficient. It is sometimes desirable to reduce the number of persons in the infected house, and a contact leaving the house during the quarantine period should have a more thorough disinfection; have the individual take a complete bath with soap and clean water, shampooing the head and hair and removing the soapsuds from the body by rinsing with clean water; then rub down with alcohol, washing the entire body in a 1-4,000 corrosive-sublimate solution (1-1,000 solution is too strong) and taking care that the solution reaches all parts of the body. Dry the body after a few minutes. Make sure that the corrosive sublimate does not get into the eyes, and remember that it is strongly poisonous when taken into the system. Do not use carbolic acid solution for disinfecting the person, as sufficient carbolic acid may sometimes be absorbed by the skin to cause fainting and serious symptoms of poisoning in those who are susceptible.

Immerse all blankets, garments, mats, hats, chinelas, crockery, and other nonmetallic articles that may be infected, in a 1-1,000 corrosive-sublimate solution or a 5 per cent solution of carbolic acid or equivalent recommended by the Philippine Health Service. Metallic articles may be placed in the carbolic solution. Garments soiled with feces or vomit should be soaked in the carbolic-acid solution, and carbolic acid solution or equivalent recommended by the Philippine Health Service should also be used for porous earthenware, metal cooking utensils, knives, etc. The immersion should be complete and must be maintained for

much organic matter, treat with the carbolic acid solution. If at least twenty minutes. The articles should then be removed and allowed to dry in the sun. Easily movable articles should be taken outside of the house for disinfection in order that they may not be recontaminated.

Where houses may be disinfected and their destruction is not necessary, collect any loose straw, pieces of wood, paper, or other combustible material in the house, remove and burn it at once. Spray or mop the walls thoroughly with a 5 per cent carbolic-acid solution or equivalent recommended by the Philippine Health Service and mop the wooden floors, or, better, scrub them with a stiff brush, using the solution freely. Earthen or stone floors should be sprayed thoroughly with a 5 per cent solution of carbolic acid or its equivalent recommended by the Philippine Health Service.

The destruction of property to prevent contagion, other than pillows or mattresses used by the sick, will rarely be necessary. No articles should be destroyed except by authority of the district health officer, in which case an inventory with the valuation must be submitted to the Director of Health.

In the disinfection of wells, sound the well and estimate the quantity of the water from its depth and diameter in accordance with the formula given. Add enough potassium permanganate, dissolved in a bucket of water, to convert the contents of the well into a 1-1,000 potassium permanganate solution. Mix this solution thoroughly with the water in the well, and wash down the sides of the well with the resulting weaker solution; if possible, have the stone sides scrubbed with a stiff brush, using plenty of the potassium permanganate solution in the well. Leave the well undisturbed for twelve hours. If at the end of that time the water is not a deep wine color, add the same amount of potassium permanganate in solution and let it stand an additional 12 hours, after which empty the well by pumping or bailing or remove the water until that which remains is clear.

In the disinfection of cesspools and vaults, add sufficient carbolic acid to make a 5 per cent solution or equivalent recommended by the Philippine Health Service; after this, whenever possible, add sufficient ashes to make a dry clean surface and then wet this again with one of the solutions named.

The object of general disinfection is (1) to find and disinfect all places soiled with fecal matter within a certain area; (2) to render safe, all exposed collections of water within said area; and (3) to destroy all flies, or lessen their prevalence, by cutting off their breeding places and food supplies.

General disinfection is indicated whenever there has been established in a barrio a focus of infection which cannot be located definitely. It is especially indicated when cases separated by an interval of more than five days occur within a certain area. General disinfection must be repeated if cases reoccur within the area disinfected after the fifth day. It is often advisable to repeat even if a case occurs within less than five days, for the reason that this case may not be a contact infection but may result from a focus which has been overlooked in the previous general disinfection.

Each disinfecting squad or unit shall consist of two disinfectors. The equipment of each unit shall consist of one spray pump, one pail of $2\frac{1}{2}$ per cent carbolic acid solution, one pail of saturated solution of potassium permanganate, with dipper.

The disinfecting party shall consist of as many disinfecting units as can be assembled conveniently by the district health officer for the purpose. Five squads (ten men) will be found to be a convenient number. The equipment of such a disinfecting party will consist of 1 carretela or cart, 20 gallons crude carbolic acid, 10 kilos of potassium permanganate in one-half kilo packages, 4 spray pumps, 10 pails, and 5 dippers. A bottle of alcohol should be carried for prompt treatment of burns from carbolic acid. Four squads (eight men) use the pumps and one squad (two men) stays with the cart, mixing and distributing disinfecting solution to the disinfecting squads. One of the disinfectors pumps while the other handles the nozzle and directs the spraying.

The solubility of potassium permanganate is 1 to 16 parts of cold water. Dissolving one half-kilo package of potassium permanganate in an ordinary pail of water makes a solution nearly saturated. By means of the dipper, the necessary amount of this strong solution may be added to water.

The carbolic acid solution is employed first, and should include thorough spraying of moist surfaces, under houses, and in the corners of the premises, closets, or other places where fecal matter exists or may have been deposited. Carefully avoid disinfecting ground surfaces which are reasonably dry and which are exposed to the rays of the sun. Disinfection of a clean house should be limited to the kitchen floor, cooking utensils, remnants of food, garbage, closets, etc., and the various receptacles for water, which are usually found at the rear of the house. If the house is dirty, a more thorough disinfection may be necessary. All collections of water, great or small, must be treated in one of two ways. If the water is dirty or contains

the water appears to be clean, add enough of the potassium-permanganate solution to give the water a deep wine color.

A very useful measure in epidemic times, with the presence of spirilli carriers, where no effective system of disposal of feces exists, is the covering of feces. Whenever it is impracticable to disinfect all of the feces in a cholera-infected community outside of Manila, the same should be either buried or covered thoroughly with good clean ashes or lime. Lime is most effective where only sufficient moisture exists to slake it. However, in this climate lime deteriorates very rapidly and clean ashes or sand generally serve equally well.

Examination of stools.—Culture tubes of alkaline agar slants, in tin mailing tubes, will be furnished by the Service upon request. A small portion of the suspected stool is streaked along the slanting surface of the agar, and the tube, properly labeled and numbered, is mailed to the Director of Health.

In cases of apparently simple diarrhea, dysentery, or only slightly suspicious of cholera the precautions taken shall be the same as those in case of true cholera, especially as to disinfections, securing specimens on agar for examination in the laboratory and a specimen from some of the contacts. (Cir. P-41 and M-29, P. H. S.) In Manila systematic taking of stool samples from all contacts and isolation and disinfection of carriers has been ordered by Circular M-52, P. H. S.).

Market disinfection.—Disinfect the market thoroughly during the evening, or early in the morning before the venders arrive. Close all unnecessary entrances. At each of the remaining entrances station a guard with a barrel of bichloride solution, 1-1,000 in strength, provided with a spigot. The hands of all persons must be disinfected with this solution. They shbuld not be allowed to dry them for two or three minutes before being permitted to enter.

Observation of contacts.—Contacts whose stools are negative may be released from quarantine at once after disinfection. They should be observed for five days; that is, visited once daily for five days, without detention or interference with personal liberty.

Cholera is an infection which fully justifies maritime quarantine practice. The system of inspection, detention and disinfection at the seaport shall be careful. In quarantine barracks it must have the assistance of a bacteriological laboratory to diagnose cases and recognize carriers and kept convenient for the assistance in mild and ambulant cases of cholera.

Whenever possible the patients and carries of cholera shall be isolated separately in special hospitals.

Disposal of dead bodies and premises upon which death occurs in the City of Manila.—(1) All cases in which the diagnosis is undetermined or in which there is reasonable ground to believe that the death was due to cholera shall be sent to the morgue.

(2) Rectal specimens shall be taken with a wire from every dead body and the same promptly sent to the laboratory to be examined for cholera.

(3) The following disinfection shall be carried out on every premises upon which a death occurs, unless the medical inspector has satisfied himself that such death was in no way connected with cholera.

(a) Disinfection of the toilet and all receptacles with which the deceased came in contact.

(b) The disinfection of all bed linen, petatis, clothing, etc., with which the deceased was connected.

(c) All contacts shall be required to wash their hands in disinfecting solutions. (Cir. I-57, P. H. S.).

37. Procedure adopted in Manila for cholera carriers.—(1) In the bacilli-carrying survey made in and around the infected districts, the taking of stool specimens shall be insisted upon at least three times in persons showing negative results. An accurate register of this survey will be kept in accordance with model blank No. 1.

(2) Persons discharged from infectious disease hospitals and detention wards (recovered cases and carriers) shall at the time of their release have their residence address verified by an assistant sanitary inspector. An accurate list with the names of persons so discharged and their residence will be made daily and forwarded to the corresponding health station. A preliminary report by telephone will precede this written list.

(3) Medical officers of health districts will see that a register be kept (blank No. 2) of these persons discharged from infectious disease hospitals and a weekly stool specimen taken until a period of two (2) months is covered. The register will show how many times each person has shown previous negative results. Any change of residence shall be reported to the corresponding station. It is understood that any positive showing shall cause the carrier to be again confined at San Lazaro.

(4) The medical officer in charge of Bilibid Prison is instructed not to permit any prisoner under suspicion as a cholera carrier to be detailed to any outside work, and in case of release from the institution, such persons shall be subject to same rule as observed in San Lazaro. (Cir. 0-78, P. H. S.).

DYSENTERY.

38. Dysentery is a term applied to a group of diseases, certain forms of which are communicable, characterized by inflammation of the mucous membrane of the large intestine.

The forms of dysentery, as classified, are bacillary and amebic.

There are various dysenteries and diarrheas of obscure causation, but communicable. In the Philippine Islands many varieties of dysenteries and diarrheas are not specific but are caused by the germs conveyed by flies.

BACILLARY DYSENTERY.

39. Bacillary dysentery is an acute communicable disease caused by *Bacillus dysenteriae*. There are two well recognized types of *Bacillus dysenteriae*. The Shiga type discovered in the Japanese epidemic and the Flexner type found in the Manila epidemic. These two types differ in their sugar-splitting action and their properties of agglutination toward specific sera.

Incubation period.—Not over 48 hours.

Quarantine period.—During the whole course of the disease.

Infective period.—From earliest onset of symptoms till complete recovery.

Transmission.—By the same ways that obtain in cholera and typhoid fever.

Incidence.—Bacillary dysentery is a disease of all ages.

Immunity.—Bacillary dysentery leaves a certain amount of protection after one attack. The antidysonteric serum has been used in treatment, but has no particular value as a preventive.

AMEBIC DYSENTERY

40. Amebic dysentery results from infection with the entameba histolytica now known as Loschia histolytica. There are marked differences between the amebic and the bacillary types of the disease. The former is a chronic infection which starts insidiously, is characterized by relapses and recurrence, is frequently associated with sequelae, such as liver abscesses and occurs sporadically or in endemic foci, mainly in the tropics.

Incubation period.—Unknown.

Quarantine period.—During the whole course of the disease.

Infective period.—From earliest onset of symptoms till negative results in bacteriological examination.

Incidence.—Amebic dysentery is a disease of all ages but it is more frequent in adults.

Immunity.—Amebic dysentery does not confer immunity.

Transmission.—By the same means as the bacillary dysentery. There has long been a suspicion that the ameba exists in its

free living state in water, upon vegetables and fruits, and other moist surfaces.

CONTROL OVER DYSENTERY GROUPS.

41. (a) Arrange for laboratory examination. (b) Infantile diarrhea should be made reportable and isolation and special cleanliness should be observed in such cases. (c) Use only boiled, distilled or bottled water, or water from an approved artesian well, for drinking purposes or for cleaning the teeth and mouth. (d) Always wash the hands thoroughly after coming from the closet and before eating and see that the servants do the same. The use of a one per cent or even a half per cent solution of tincture of iodine for submerging the hands after washing them affords additional safety. (e) Do not touch water or food with the hands unless they have just been washed, well dried, and disinfected when practicable. These precautions must be enforced on the servants since it is often by their carelessness that such diseases are spread. (f) Do not dip water out of the receptacle, but pour it out; or, better still, use a receptacle which is fitted with a faucet. (g) All food should be cooked. Fruit that grows on trees well above the ground may be safely eaten unless it has been contaminated by handling. (h) Flies may carry the organisms of dysentery, cholera and typhoid on their feet; therefore as a protection against contamination from this source all food should be covered as soon as it is cooked. (i) All manure and garbage should be kept in covered receptacles and properly disposed of to prevent the breeding of flies. (j) Boil all water used for diluting milk. (k) Keep kitchen and table dishes thoroughly clean and scald the dishes each time before they are used. (l) Vegetables and fruit which grows on or near the ground should not be eaten unless cooked. Raw vegetables are dangerous. Do not use human excrement for fertilizing purposes. (m) No diarrhea or disorder of the bowels, however slight, should go untreated. (n) The bowels and other eliminating organs of the body should be kept in good condition. (o) The dejecta of dysentery patients should be thoroughly disinfected by adding to them two or three times their bulk of 5 per cent carbolic acid; or a 1:1,000 solution of formaldehyde; or a 5 per cent solution of creolin; a 1:500 solution of larvacide; a 1:1,000 solution of bichloride of mercury; or by burning or boiling them. The disinfectant and the stools should remain in contact for at least one-half hour, and than they may be disposed of in the closet or by burying and covering with earth. (Cir. K-77, P. H. S.) (p) Identification of carriers by the systematic examination of stools.

TYPHOID FEVER.

42. Typhoid fever is an infection due to the *Bacillus typhosus*, which enters the body through the alimentary canal and is shed off in the feces and urine of the typhoid patient.

Incubation period.—Least, 7 days; average 12 to 14 days; greatest, 23 days.

Quarantine period.—Twenty-three days from last exposure to infection.

Infective period.—The feces must be regarded as infective throughout the duration of disease, from even before the fever and until convalescence is completed. In the urine the bacilli appear some time after the onset of the disease and remain infective throughout the course of fever and convalescence.

Transmission.—(1) Typhoid fever does not arise spontaneously from filth, although propagated through infected filth; every case is derived from an antecedent case. (2) By carriers, "walking typhoid" cases and "recovered carriers" who continue to emit virulent typhoid bacilli for weeks, months, or even years after apparent recovery. (3) *By contact*.—Directly from one person to another. The infected excreta contaminating the fingers of nurse or other associate of the patient, or some object by which the fingers may become contaminated. Infection by mouth is easy, directly from the fingers or through food and drink. (4) *By water*.—Water supplies become infected through the improper disposal of the undisinfected excreta of typhoid patients. The ice, if it is manufactured without bacteriological purifying process. (5) *Milk*.—The milk is a dangerous vehicle of infection for typhoid fever because the bacilli typhoid grows and multiplies rapidly in that medium. Milk supplies, bottles or other receptacles, milk products, etc. may become infected through carriers, patients, infected water used for washing, etc., etc. (6) *Flies*.—The conveyance of fecal matter on the feet of flies explains this manner of infection. (7) *Shellfish*.—Oysters and other shellfish grown or floated in polluted waters. (8) Raw vegetables and fruits, and other foods. Vegetables may become infected through fertilization with fresh night-soil, sewage, excreta, polluted water, etc. Other foods (e. g. fruits, bread, candy, etc.) by handling.

Incidence.—The greater part of typhoid mortality falls on the middle periods of life (over half at 20-25 years, maximum specific death rate as 20-25).

Immunity.—Second attacks occasionally occur. Killed cultures of typhoid bacilli (*vaccinia antityphoidea*) are injected

three times, at intervals of seven days at least, as protective inoculation.

Paratyphoid fever.—Paratyphoid fever is caused by the paratyphoid bacillus which is similar to the typhoid organism but distinguishable from it by laboratory tests.

The ways of transmission, control, etc. of the paratyphoid fever is the same as that of typhoid fever.

Control.—(1) Cases of typhoid and paratyphoid (A & B) fever are strictly reportable. Suspected cases (fever of about one week duration and others) are not exempted from notification.

(2) Serological reaction (Widal-Gruber test) will promptly be resorted to, and its results if positive, will be considered the starting point of all measures to be instituted.

(3) In cases amongst indigent people unable to pay laboratory fees, the examination may be made free by forwarding the blood specimens through the corresponding health officers to the Bureau of Science or Provincial Laboratories. Capillary tubes for collection of the blood specimen will be furnished free by any of the health officers.

(4) Cases of typhoid and paratyphoid fever having no medical attendance in their residences will be disposed of by sending them to any of the existing hospitals (not excluding San Lazaro Hospital) for proper isolation and treatment. In provinces the isolation may be made in the hospital or patients' residences.

(5) Cases attended by any registered physician may be allowed to remain in their residences and be treated therein provided the attending physician will certify in writing to the Director of Health or his authorized representatives. (a) That the case has been reported. (b) That the attending physician assumes the responsibility of establishing a reasonable isolation of the patient and close attendants, and that every necessary proceeding of *concurrent disinfection* will be carried out in the individual case referred to. (c) That the case will be attended by the attending physician until the termination of the case (recovery, removal to hospital, or death), and that if, for any reason, the physician ceases to render his services to the patient before the termination of the case, previous report of his intention to withdraw from the case, shall be made to the Director of Health or his authorized representatives. (d) Upon the termination of the case, the fact will promptly be reported to the Director of Health or his representatives.

(6) In case the attending physician does not desire to conduct or supervise the work involved in the *concurrent disinfection* (disinfection of patient's discharges, hands of contacts before

eating, table utensils, drinking water containers, ice-boxes, extermination of flies, etc.) selected disinfectors of the Philippine Health Service will, upon application, take charge of such work. *Terminal disinfection* will at any rate be required to be done by disinfectors of the Philippine Health Service.

(7) Rule 5 shall not apply to hotels, tenement houses, boarding houses, colleges, schools, dormitories, or other institutions, nor in private residences where the number of occupants is found to be so great as to interfere with, or make it altogether impracticable to secure proper isolation of the patient: *Provided*, That cases of typhoid or paratyphoid fever may be permitted to be kept in isolation in colleges, schools with intern pupils, or convents, if in the opinion of the Director of Health or his authorized representative, such colleges, schools with intern pupils, or convents are equipped with a hospital or infirmary which guarantees the maintenance of an effective isolation.

(8) Physicians in charge of, or otherwise connected with, official or private hospitals in the city of Manila, are hereby earnestly requested to see that the Director of Health be promptly informed of the movement of typhoid or paratyphoid cases to and from their respective hospitals, this information to cover principally the following points:

(a) Notification of the case as it enters the hospital or the diagnosis made. (b) Discharge for recovery, with the patient's prospective address. (c) Removal from hospital not due to recovery, with the prospective address. (d) Death of patient.

(9) The search for and disposal of carriers should be taken care of by the medical officers of the Philippine Health Service.

Typhoid carriers may at the discretion of the Director of Health be disposed of as follows:

(a) They may be allowed to live in their residences under the close surveillance of the health authorities, with the understanding that they will, during the whole length of the quarantine, be subject to any instructions given to, and any prophylactic measures imposed upon them by the health authorities, principally in so far as the prohibition of attending or frequenting places of public resort and particularly of handling, preparing or selling food (except for the contact's own use) is concerned.

The provisions of Rule 7 itself for typhoid or paratyphoid cases will with equal force apply to typhoid or paratyphoid carriers.

(b) Carriers who prove themselves unable or unwilling to carry out the restrictive measures imposed upon them by the health authorities, may be subject to isolation in San Lazaro

Hospital in the city of Manila or other hospitals in provinces until satisfactory proof is obtained that they no longer harbor the infection.

(10) Immunization with antityphoid vaccine is not compulsory unless otherwise directed by the Director of Health in view of the circumstances of the case. Only indigent persons will be entitled to receive free vaccination.

(11) The mixed standard vaccine used by the "Typhoid Committee," shows the following composition per cc.

	Millions.
B. typhosus	250
B. paratyphosus A	125
B. paratyphosus B	125

The vaccination of adults is carried out as follows:

First injection, $\frac{1}{2}$ of a cc.

Second injection, 1 of a cc.

Third injection, 1 of a cc.

The interval between one injection and the next should be one week.

The dose for children must be reduced according to age.

Ampoules containing variable amount of this standard vaccine may be purchased at the Bureau of Science.

The immunity conferred by antityphoid vaccine lasts from one to three years. Antityphoid vaccination does not affect typhoid carriers as far as to the getting rid of the bacilli is concerned.

ARTICLE 3.

DISEASES SPREAD BY INSECTS AND VERMIN. MOSQUITO-BORNE DISEASES.

MALARIA.

43. Malaria is a specific disease due to the presence in the blood of the plasmodium of Laveran.

Incubation period.—About 12 days.

Infective period.—So long as the plasmodium remain in the blood of the patients.

Transmission.—Malarial fever is only transmitted from man to man by the bites of a mosquito and only certain kinds of mosquitoes known as anophelines and by no other means.

Incidence.—Malarial fever may occur in all ages but under 2 years of age it is not frequent.

Immunity.—There is no true immunity to the disease. Repeated infections, especially during early life, leave a very pronounced resistance. In malarious regions many persons carry the parasites without any manifestations of the disease.

Control.—(1) Registration of cases with facilities for blood examination in order to make a precocious diagnosis. (2) *Personal prophylaxis.*—(a) All persons known to be sick with malaria should be protected by mosquito nets so that mosquitoes cannot bite them and carry the disease to well persons. When practicable, the room should be screened so as to keep mosquitoes out. (b) While it is very important to protect persons suffering from malaria by mosquito nets and screens, it is equally important that those who are not sick should be protected. Every bed, petate, lounge, or couch upon which persons sleep should be protected by a net for the purpose of preventing mosquito bites and the diseases which they cause. (c) If a bed is too narrow so that one has to sleep with his arm or other portion of his body directly against the mosquito net very little protection will be afforded, as mosquitoes can easily bite through the net; or if the net is not well tucked in or if there are holes in it, mosquitoes will get into the net. If mosquitoes are found within the net they should be killed and not merely driven out. (d) Quinine prophylaxis. (3) Mosquito suppression. (a) Fill in low places. (b) Drain all the surfaces of the land with drains. (c) Clear the highland and keep it under cultivation. (d) Clearing the brush and high grass by putting the land under the action of the hot sun. (e) Introducing culicide fish into the pools, streams, ditches and other collections of water. (f) Maintain covered cisterns, rain barrels, wells, receptacles and other containers of water in the houses. (g) Get rid of the mosquitoes by a film of coal oil, larvicides or other culicides upon the water surfaces.

YELLOW FEVER.

44. Yellow fever is a disease characterized by a febrile paroxysm succeeded by a brief remission and a relapse and caused by a microorganism unknown conveyed by the bite of a certain kind of mosquito. Fortunately this disease has as yet never been reported in the Philippines.

Incubation period.—The parasite requires about 12 days for its development in the mosquito and the incubation period in the infected persons is from two to five or six days.

Infective period.—The infection is absent from the blood after the third day of the disease and mosquitoes do not become infective after this period.

Transmission.—Yellow fever is only transmitted by the bite of one kind of mosquito, the *stegomyia calopus*.

Incidence.—Yellow fever is a disease of all ages.

Immunity.—There is no natural immunity to yellow fever, but an attack of yellow fever affords protection against subsequent attack.

Control.—(a) Screening cases of yellow fever and all suspected cases of yellow fever. (b) Destruction of infected insects. (c) Suppression of stegomyia through the control of their breeding places. (d) The stegomyia grow in containers of water in the neighborhood of human habitations, therefore such containers should be kept covered to cause their destruction. (e) Yellow fever is not transmitted by fomites and hence disinfection of articles of clothing, bedding or merchandise, supposedly contaminated by contact with those suffering from the disease is unnecessary. (f) All mosquitoes on vessels from ports where yellow fever is present shall be destroyed.

DENGUE.

45. Dengue is the name applied to a specific and highly infectious fever chiefly characterized by rubeoloid eruption and peculiarly severe rheumatic-like pains in the joints and limbs.

Incubation period.—Four to five days.

Infective period.—During the febrile stage of the disease.

Transmission.—By the bite of infected mosquitoes, probably the culex fatigans.

Sources of infection.—The blood of infected persons.

Incidence.—All ages.

Immunity.—There is no immunity to dengue.

Quarantine period.—None.

Control.—(a) Recognition of the disease by clinical symptoms. (b) Isolation. The patient must be kept in a screened room. (c) Upon termination of the case fumigation of the room and house in order to destroy the mosquitoes. (d) General measures directed toward elimination of mosquitoes. Screening of rooms.

FILARIASIS.

46. Filariasis is a term applied to a group of diseases caused by the long thread worm called filaria. There are several species originating different filarial diseases, which are the following: Abscess, lymphangitis, varicose groin glands, varicose axillary glands, lymph scrotum, cutaneous and deep lymphatic varices, filarial orchitis, chyluria, elephantiasis of the leg, scrotum, vulva, arm, breast, and elsewhere, chylous diarrhea and probably other forms of diseases depending on obstruction or varicosity of the lymphatics.

Incubation period.—From 15 to 20 days.

Infective period.—So long as the larvae remain in the blood of the patients.

Transmission.—By the bite of a mosquito, *Culex fatigans* according to Manson and *Anopheles Nigerrimus* according to James.

Incidence.—In all ages but under 2 years it is not frequent.

Immunity.—No immunity.

Control.—As it is not definitely known how many species of mosquitoes convey the infection, the preventive measures must be along general lines, embracing a combination of those described under malaria and yellow fever, as well as general sanitation and personal hygiene.

FLY-BORNE DISEASES.

47. Some diseases may be transmitted by flies in two ways: (a) Through the bite and (b) mechanically.

The diseases transmitted by bites are: (a) Infantile paralysis; (b) anthrax; (c) sleeping sickness; (d) pappataci fever or three day fever.

Acting mechanically through the conveyance of infected matter on its feet and proboscis. Flies may carry the germs of typhoid fever, diphtheria, tuberculosis, infantile diarrhea and enteritis, smallpox, erysipelas, glanders, and others.

Transmission.—The ways in which infectious matter may be carried from privy vaults and infectious discharges to milk and other food, infants, nursing bottles and the like, have been indicated in previous pages.

Control.—The suppression of fly-borne diseases may be accomplished by the destruction of the breeding places of the flies in the manner stated in section 7, "Nuisances," herein.

FLEA-BORNE DISEASES.

PLAGUE.

48. *Definition.*—Plague is a specific communicable disease characterized by fever, the development of buboes, a rapid course, a very high mortality and the presence of a specific bacterium in the lymphatic glands, viscera and blood (Manson).

At least three clinical types are now recognized: (1) bubonic; (2) pneumonic, and (3) septicemic (Rosenau).

Infectious agent.—*Bacillus pestis*.

Incubation period.—Commonly from 3 to 7 days, although occasionally prolonged to 8 or even 14 days.

Quarantine period.—Contacts for 7 days.

Infective period.—From the beginning of symptoms for the whole period of illness.

Mode of transmission.—(a) Direct in the pneumonic form; (b) in other forms by the bites of fleas (*Xenopsylla cheopis* and *ceratophyllus fasciatus*) by which the disease is carried from rats to man, also by fleas from other rodents; (c) from sputum, urine (not always), feces, sweat (only when skin is infected), and blood (only in late stages, not always) of infected individuals; (d) infection from convalescent case may occur after three weeks, and even after 72 days, occasionally; (e) bedbugs may transmit the infection; (f) flies may possibly convey the infection.

Incidence.—All ages are exposed to contract plague.

Immunity—One attack of plague usually protects for life. If a second attack occurs in the same person, the second attack is mild. Artificial immunity may be acquired by the injection of antiplague serum or by the Haffkine's prophylactic culture.

Control.—(a) Recognition of the disease. Clinical symptoms, confirmed by bacteriological examination of the blood, pus from glandular lesions or sputum; (b) isolation. Patient in hospital if practicable; if not, in a screened room which is free from vermin. In plague pneumonia personal prophylaxis to avoid droplet infection must be carried out by the persons who come in contact with the sick. Masks or veils of cheese cloth should be worn as protective measures; (c) immunization. Passive of known exposed contacts; active of those who may be exposed; (d) concurrent disinfection. All discharges and articles freshly soiled therewith; (e) terminal disinfection. Thorough cleansing followed by thorough disinfection; (f) extermination of rats and vermin by use of known methods for their destruction; (g) destruction of rats on ships arriving from infected ports; (h) examination of rats, ground squirrels, etc., in areas where the infection persists for evidence of endemic or epidemic prevalence of the disease amongst them; (i) supervision of autopsies of all deaths during epidemics; (j) supervision of the disposal of the dead during epidemics whether by burial, transfer, or holding in vault, whatever the cause of death; (k) cremation, or burial in quick lime, of those dying of this disease; (l) whenever a suspicious case has occurred petroleum or a strong carbolic acid solution (not less than 5 per cent) should be sprayed copiously about the house and bed, etc., to kill vermin (fleas and bedbugs).

The following are the rules issued by the Philippine Health Service for fighting plague.

49. (1) Do not let rats come ashore from ships that may come from infected ports.

(2) When ships come up to a dock, fend off at least 6 feet

so that rats cannot come ashore by walking on the ropes, and fumigate all vessels to kill the rats it carries.

(3) Keep all garbage in tightly covered galvanized-iron tins so that rats cannot get food. For the same reason keep all food in rat-proof boxes. This will starve the rat or make it hungry for bait in a trap or for poison.

(4) Make all dwellings rat-proof by concreting. Rats are most dangerous in the spread of plague if they live in the same house with man. Therefore, if houses are so built that they cannot harbor rats, man is less likely to contract the disease.

(5) Make all stores, warehouses, etc., rat-proof by concreting.

(6) If houses cannot be concreted, build them at least 1 meter from the ground so that it will be open underneath the house and dogs and cats can get beneath, and rats cannot find a hiding place.

(7) Tear out all old, dirty, insanitary places and remove all collections of rubbish, and thus destroy places where rats may hide and breed. All rat nests found should be destroyed. If the rat cannot find a place to hide it may be more easily caught.

(8) Houses should not be ceiled inside, for rats will hide in the ceiling. The ordinary native bamboo and nipa house raised from the ground and without ceiling inside is less likely to harbor rats. Special attention is necessary, however, to prevent rats from gaining access through the ends and finding harboring places in the bamboo and in the nipa of the roof.

(9) Trap and poison as many rats as possible.

(10) Isolate all human cases of plague.

(11) Make a thorough inspection of all dead bodies in order to be sure that death has not been caused by plague.

(12) Report all suspicious cases of sickness and make a house-to-house inspection to learn whether suspicious cases of sickness are being concealed.

(13) The houses in which plague has developed must be disinfected with kerosene to kill fleas and bedbugs and with larvicide or other disinfectant to kill the microorganism. Such disinfection must include a thorough saturation of the beds and chairs, walls, and floors with the kerosene so that the bedbugs and the fleas will surely be exterminated.

(14) In pneumonic plague it is necessary to thoroughly disinfect house and all bedding and clothing.

RATS.

50. (15) The domestic rats are of four kinds: The large gray or wharf rat (*epimys norvegicus*), the smaller black or Indian

or house rat (*Epimys alexandrinus*), and the common house mouse (*Mus musculus*). Rats may live as long as five years. Each female may bear three litters a year with an average of 10 young in a litter. The *Epimys alexandrinus* is rare in Manila, but a rat resembling it, though much smaller, is common (*Epimys querceti*). The most common rat is the large gray rat.

(16) It is very important when plague is present to find out just in what house or block of houses rats infected with plague may be present, therefore all rats that are caught must be first killed, then dipped in a disinfecting solution to kill the fleas, tagged with the number of the house and street in which they are caught, and sent to the laboratory for examination. A very good way to convey them to the laboratory is to dip them and then place all the rats from one house in a tight, strong oiled paper bag and tag the bag. If a rat infected with plague is found, special attention is paid to trapping, poisoning, rat-proofing, and disinfecting in the house in which the rat was found as well as in all other houses in the block and in the adjoining blocks.

HOW TO CATCH RATS.

51. (17) There are two types of traps: Cage traps and spring traps.

(18) *Cage traps*.—Put these traps in dark, quiet places where rats are known to run. Cover them with a sack leaving the entrance free. Tie the bait inside of the trap. If one kind of bait does not attract rats, use a different kind. Fish heads, coprax, chicken heads, bacon, cheese, green vegetables, grains, and meat should all be tried from time to time. Do not kill the rats in the trap when they are caught, as rats are very suspicious creatures and those not yet caught may be frightened by the noise so that they will not go into a trap. Take trap and rat to the health station, labeling the trap with the street and number of the house. Always smoke a trap after rats have been caught in it before using again. The bait in a trap should be frequently changed and not allowed to become stale. A drop of oil of anise placed on the bait will aid in attracting rats.

(19) *Spring traps*.—Set trap and put in a dark, quiet place where rats are known to run, using bait as before. This kind of trap kills the rat and it should be taken out on the spot, dipped in larvicide, tagged, and the trap smoked and reset.

(20) *Poisoning*.—The poisons used are arsenic, phosphorus, and strychnine. Arsenic is the best, as it is tasteless. It is mixed with rice, cheese, or meal and put where rats can get it,

i. e., down the rat holes or runs, under lumber piles, in the ceiling, etc. It should not be touched by the hands as the smell of the human hands on the bait may make the rat suspicious and it may refuse to eat it. A piece of the poisoned bait about as large as the thumb should be taken up on the end of a small scoop made from a piece of wood. It may then be placed on a piece of paper or small dish or directly on the spot. Never put rat poison where it can be eaten by children or domestic animals like chickens, dogs, and cats.

(21) Three good recipes for rat poison:

I.

5 kilos of rice.

1 kilo of commercial arsenic.

Directions.—Mix thoroughly and boil until cooked. Stir frequently.

II.

3 parts by weight of sugar.

13 parts by weight of oatmeal.

4 parts by weight of commercial arsenic. Mix thoroughly.

III.

4 kilos ground rusty bacon.

3 kilos ground corn soaked over night in a solution of syrup and water.

1½ kilos commercial arsenic.

(22) The Manila ordinances empower the Director of Health to give prophylactic inoculations, antitoxin, and vaccine against plague when it is deemed necessary (R. O., sec. 924); and also give him the power, when a house is found to be infected with rat or human plague, to make such alterations, repairs, issue vacating orders, or take such other action as in his judgment is necessary to prevent the spread of infection (R. O., sec. 935). An ordinance also prohibits any unauthorized person from disturbing or removing any traps or poison placed by agents of the Bureau of Health (R. O., sec. 936). An ordinance also makes it the duty of all persons in the city of Manila to co-operate in the destruction of rats, mice, or other vermin when deemed necessary by the Director of Health (R. O., sec. 929). And where any building or part of building is infested with rats in such a manner as to endanger the public health, it is considered a nuisance (R. O., sec. 937).

52. Infantile kala-azar, is also transmitted by fleas.

TICK-BORNE DISEASE GROUP.

53. Among the diseases transmitted by ticks the Texas fever, canine babesia, "spirillose des poules," African relapsing fever and Rocky Mountain spotted fever are the most common. All are

characterized by high fever, rheumatic-like pains and intoxication symptoms.

Infectious agents.—Unknown.

Source of infection.—Blood of infected animals and infected ticks.

Mode of transmission.—By bites of infected ticks.

Incubation period.—Three to ten days, usually 7 days.

Period of communicability.—Has not been definitely determined, probably during the febrile stage of the disease.

Methods of control.—(a) Isolation of the patients. None other than care exercised to protect patients from tick bites when in endemic areas. (b) All ticks on the patients should be destroyed. (c) Destruction of ticks by clearing and burning vegetation on the land in the infected zones. (d) Destruction of the ticks on domestic animals by dipping. (e) The destruction of small mammalian hosts as ground squirrels, chipmunks, etc.

BEDBUG-BORNE DISEASE GROUPS.

54. In this group are included the European relapsing fever, the specific agent of which is the Spiroschauvinnia recurrentis of Obermeier and the Indian kala-azar which is caused by the Leishmania donovani.

Cases of relapsing fever have not as yet been registered in the Philippines.

Kala-azar is characterized by anemia and enlargement of the spleen.

Methods of control.—The methods of control for this group of diseases are similar to those used for tick-borne diseases.

LICE-BORNE DISEASE GROUPS.

55. The types of this group of diseases are typhus fever and Argelia relapsing fever; European relapsing fever may also be transmitted by lice. We will describe only typhus fever.

Definition.—Typhus fever is frequently confused with typhoid fever, as relapsing fever with malarial fever, but although typhus fever is characterized by high fever and predominance of intoxication symptoms, the three periods which characterize typhoid fever are lacking in the former disease.

Infectious agent.—The bacillus typhi-examthematici though not yet definitely determined or generally accepted.

Incubation.—Five to 20 days, usually 12 days.

Quarantine period.—Exposed susceptible for 12 days since last exposure.

Infective period.—Until 36 hours have elapsed after the temperature reduces to normal.

Transmission.—(a) Infectious germs transmitted by lice (*pediculus corpori*, *p. capitis*; *p. vestimenti*). (b) The blood of infected individuals.

Methods of control.—(a) Recognition of the diseases by clinical symptoms. (b) Confirmation by bacteriological examination of blood. (c) Isolation of the patients in vermin-free rooms. All attendants should wear vermin-proof clothing. (d) Destroy all vermin and vermin eggs on body and clothing of patients. Rooms to be rendered free from vermin. (e) Delousing of persons, clothing and premises during epidemic or when they have come or have been brought into a disinfected place from an infected community.

WORM DISEASES.

56. *Tapeworms. Taenia mediocanalata or beef tapeworm.*—This worm spends the young or embryo stage of its life in the muscles of cattle. When meat containing these parasites is eaten raw or not sufficiently cooked, the young tapeworm is taken into the body and develops in the intestines into a tapeworm which may reach a length of 8 meters.

57. *Taenia solium or pork tapeworm.*—This is a somewhat similar worm in size and appearance, but passes its young or embryo stage in the muscles of the pig. When the meat of the pig is eaten raw or not sufficiently cooked the young tapeworm is taken into the body and develops in the intestines into the fully grown worm.

58. *Dibothriocephalus latus or fish tapeworm* is another very large tapeworm which passes its young or embryo stage in the muscles of certain fish.

All of these worms have a similar life history and require two animals to complete it: Cattle, pig or fish, and man. After man has eaten the meat infected with any one of these parasites and it has developed into the mature worm, he passes out in his feces the eggs of the parasite. These eggs, if from the *Taenia solium*, are then eaten by a pig and they then develop into the embryo within the stomach of the pig and then migrate to the pigs muscles, producing what we term *cysticercus cellulosae* or *measly pork*, which, if eaten by man, again develop into the tapeworm.

It should then be easily seen why pigs should not be allowed to act as scavengers and eat the filth discharged from man's intestines, which, as is well-known, is a common practice in the Philippine Islands.

59. *Trichina spiralis.*—This is a small worm which, when fully

grown, lives in the intestines but which in its young or embryo stage lives in the muscles of the pig, man or rats.

The muscles of the tongue or diaphragm are usually affected. If man eats the meat of a pig which is infected with this parasite the young worm is liberated in his stomach. It grows to be an adult worm, lays its eggs, which develop, and the young from the egg then makes its way to his muscles and gives him a very serious disease known as trichinosis. At the same time the eggs are also discharged in the feces, which are eaten by the pig and the same process takes place in the pig's stomach, and its meat becomes infected to infect in turn the person who eats that meat. Rats may also harbor the parasite, and in this way it is kept alive; for the rat eats the infected pork, and a pig will in turn eat a dead rat that has trichinosis.

60. *Ascaris lumbricoides*.—This is a very common worm in the Philippine Islands. It passes its entire life in the intestines of man. The egg passes out of the feces and is returned to the mouth of another person by dirty fingers. The egg is so small that it can only be seen by the microscope. It is readily seen that if a person who harbors this worm does not wash his hands after coming from stool, and eats out of a common dish of rice used by the rest of the family he may, from his dirty fingers, carry eggs of the worm to the food and infect the entire family; or the feces containing the egg may contaminate the drinking water, and the egg would be taken into the stomach by drinking the water. It will be noticed that this worm is carried in the same way as typhoid fever, dysentery, and cholera, and it therefore gives us another reason why we should be careful to properly dispose of human excrement, keep our hands clean, and use a fork or spoon instead of eating out of a common dish with our fingers.

Seat worms are small worms which also live in the intestines and which are transmitted just like the *Ascaris*, and therefore the same precautions should be taken to avoid ingesting them.

61. Control.—(a) Do not pollute the surface of the soil or the water with human excrement, nor let the pig act as the scavenger. Dispose of it in a sanitary manner.

(b) Keep the hands clean. Be sure and wash them after coming from stool or when about to eat or prepare food.

(c) Do not dip the fingers into a bowl of food used in common by other people. All should use a fork or spoon.

(d) All meat intended for human consumption should be inspected before and after killing and if found infected with any parasite it should be condemned.

- (e) Thorough cooking will kill the parasites in meat. Smoking or salting frequently does not kill the parasite.
- (f) Where soil is being polluted with human excrement it is necessary to wear shoes.
- (g) Drink only water that has been boiled, distilled, or that which comes from an approved artesian well.

HOOKWORM.

62. Hookworm is a disease also called *uncinariasis* or *ankylostomiasis* and is due to infection of the intestines with a small worm.

Incubation period.—Least five weeks, greatest seven weeks. This period corresponds to the time that the parasite needs to end its evolution and fixation on intestinal mucous membrane.

Infective period.—So long as the parasite resides in the intestines of the patient.

Transmission.—(1) Through the skin. The eggs infect the soil. The larvae get upon the skin of the hands of persons touching the soil, of the feet of persons walking barefooted upon it. The larvae make their way through the skin, and then enter the small intestines. (2) By mouth in drinking water. (3) In polluted food or water. (4) From contaminated objects, such as dirty fingers. (5) The infection leaves the body exclusively in the feces which contain the eggs of the parasite. (6) By dust which conveys dried worms (exceptional).

Incidence.—*Uncinariasis* is a disease of all ages. The manner of life in the tropics, especially that of the poor people facilitate the contamination by *ankylostomiasis*.

Immunity.—There is no acquired immunity to *uncinariasis*. The natives of the tropics are often infected but have comparatively slight symptoms.

Control.—(a) Prevention of soil pollution by the use of proper privies and extension of sewers and drainage. (b) Proper disposal of excreta. (c) Avoidance of contact with polluted soil. (d) Avoidance of polluted water and foods. (e) Boiling the water from suspicious sources. (f) Treatment of all infected persons. (g) Education. (h) Cleanliness.

ARTICLE 4.

DISEASES HAVING SPECIFIC OR SPECIAL PREVENTIVE MEASURES.

SMALLPOX.

63. Smallpox is the most highly communicable of all the major diseases with which health authorities have to deal, but the

prevention of smallpox depends primarily upon vaccination, secondarily upon isolation and disinfection.

Infectious agent.—Unknown.

Incubation period.—Twelve to fourteen days.

Quarantine period.—Segregation of all exposed persons from date of last exposure to until protected by vaccination.

Infective period.—From first symptoms to disappearance of all scabs and crusts.

Source of infection.—Secretions of the skin and discharges from mucous membranes of infected persons.

Mode of transmission.—(a) By direct personal contact; (b) by articles soiled with discharges from lesions; (c) by the discharges of the body, including feces, urine, and of the nose and throat, from which the virus may be carried by flies.

Incidence.—All ages are exposed to contact smallpox, but is more frequent in infants.

Immunity.—Smallpox itself does not always protect against smallpox. Some people have two and even three attacks of smallpox.

Control.—(a) Recognition of the disease by clinical symptoms; (b) isolation; (c) hospital isolation in screened wards free from vermin until the period of infectivity is over, and concurrent disinfection of all discharges and articles soiled therewith; (d) terminal disinfection. Thorough cleansing and disinfecting of premises; (e) general vaccination in infancy, and vaccination of children on entering school and of entire population when the disease is prevalent.

CHICKEN POX.

64. Chicken pox (*varicella*) is usually regarded as one of the minor communicable diseases in that the mortality is low. Cases of chicken pox shall be reported, if for no other reasons than that it is often mistaken for smallpox (Rosenau).

Infectious agent.—Unknown.

Incubation period.—Two to three weeks.

Quarantine period.—Nineteen days from exposure to infection.

Infective period.—From appearance of eruption till primary scabs have disappeared from the mucous membranes and the skin.

Incidence.—No age is exempt.

Immunity.—One attack produces a definite immunity.

Modes of transmission.—(a) Recognition of the disease by the clinical symptoms; (b) isolation; (c) exclusion of patient from school and prevention of contact with nonimmune persons; (d)

concurrent disinfection of articles soiled by discharges from lesions; (e) terminal disinfection through cleansing.

65. The following rules governing the handling of varicella cases in the city of Manila may be applied to provinces:

IN THE CASE OF VARICELLA (CHICKENPOX).

1. Cases of varicella found in private residences may be isolated there and not sent to the San Lazaro Hospital, provided that request for permission not to isolate is made by the physician in attendance upon the case, this physician to be held responsible that the quarantine will be faithfully maintained. Such quarantines shall be under the supervision of the Director of Health or of his authorized representative.

2. The preceding regulation will not apply to the following cases:

(a) Where no physician is in attendance;

(b) Where cases of varicella (chickenpox) occur in hotels, tenement houses, boarding houses, colleges and schools, dormitories, or other institutions or private houses the number of occupants of which exceeds ten.

Provided, That cases of varicella may be permitted to be isolated in colleges or schools with intern pupils, provided that in the opinion of the Director of Health or his authorized representative such institution is equipped with a hospital or infirmary which guarantee the maintenance of an efficient isolation.

3. Any question arising with regard to the practicability of isolation in private houses, as well as the diagnosis of the disease in doubtful cases, shall be submitted to the Director of Health or his authorized representative, whose decision in the matter shall be final.

4. Any house in which a case of varicella is isolated by authority of the Director of Health shall bear a placard printed in large type and so placed as to be readily visible from the street, announcing that a case of varicella is quarantined therein. This placard will be furnished by the Philippine Health Service, and shall not be removed nor any portion thereof erased or altered except by the Director of Health or his authorized representative.

5. As a condition for the isolation of a case of varicella in a private residence, and before such quarantine is placed in effect, all persons, whether permanent or temporary residents of the home, must be vaccinated against smallpox, such vaccination to be performed by the Philippine Health Service, or by the physician of the patient provided he desires to perform the work.

6. It shall be the duty of the physician in attendance upon a case of varicella (chickenpox) authorized for isolation at a

private residence to notify the Director of Health of the termination of the period of isolation, which however, shall not be regarded as finally terminated until the premises have been disinfected by the disinfection personnel of the Philippine Health Service in the manner and at the time designated by the Director of Health or by his authorized representative.

All cases of measles and varicella (chickenpox) isolated in their respective residences shall be reported as usual to the central office, Philippine Health Service, stating the name of the private physician who is in charge of the case, and the date on which the quarantine has been raised. (P. H. S. Circular 0-21, 1916.)

RABIES.

66. Definition.—Rabies (*hydrophobia*) is an acute, specific rapidly fatal infection communicated from a rabid animal to a susceptible animal, usually through a wound produced by biting. Man always contracts the disease from some lower animal, usually the dog (Rosenau).

Infectious agent.—Unknown. The presence of the “Negri bodies” by microscopic examination of the brain substance of animals shows at once the existence of rabies. Failure to find them does not, however, necessarily signify that the animal did not have rabies.

Incubation period.—Usually two to six weeks. May be prolonged to six months or even longer.

Quarantine period.—For fifteen days (in the dog, not known in man) before the onset of clinical symptoms and throughout the clinical course of the disease.

Source of infection.—Saliva of infected animals.

Mode of transmission.—Inoculation with saliva of infected animals, through abrasion of skin or mucous membrane, almost always by bites or scratches.

Incidence.—Rabies may develop in any person bitten by a rabid animal, regardless of age, unless the Pasteur treatment is given.

Immunity.—None.

Methods of control.—(a) Recognition of the disease. Clinical symptoms confirmed by the presence of Negri bodies in the brain of an infected animal or by animal inoculations with material from the brain of such infected animal; (b) isolation. None if patient is under adequate medical supervision and the immediate attendants are warned of possibility of inoculation by human virus; (c) immunization. Preventive vaccination (Pasteur treatment) after exposure to infection by inoculation; (d) concurrent disinfection of saliva of patient and articles soiled there-

with; (e) terminal disinfection; (f) muzzling of dogs when on public streets or in places to which the public has access; (g) detention and examination of dogs suspected of having rabies; (h) registration of dogs; (i) instruction of dog-owners for keeping of dogs and the symptoms of rabies; (j) legal responsibility of dog-owners; (k) reporting of dog-bites; (l) rabies or suspected rabies in animals shall be reported; (m) licensing of all dogs.

87. The following rules and regulations governing the handling of rabies in the city of Manila may be applied in the provinces.

(1) The police force of the city of Manila will have the entire control of enforcing the provisions of such notice. This notwithstanding, the officers and employees of the Philippine Health Service are directed to assist and coöperate with the Manila Police Force in any possible way as regards information and request for prompt executive action found advisable especially in all cases in which human beings are actually or supposedly affected, viz.; persons bitten by mad or suspected dogs.

(2) In handling dogs of this nature, any person bitten by a dog will be considered a suspicious case of human rabid infection until full evidence to the contrary is satisfactorily shown.

(3) Whenever a person is reported to have been bitten by a dog, the first step to be taken is to locate the dog and than hold it in observation in the San Lazaro School of Veterinary Science pending report.

A tag containing data for identification of the dog will be securely attached around the neck. The required data are as follows:

Health District No.....	
Name	Date.....	
Name of dog (if any).....		
Sex.....	Color.....	Bred.....
Residence		
Where found.....		
No. and date of license.....		
Name and address of owner.....		

Moreover, the printed form used for "Miscellaneous Examination" (copy attached) with the data contained on the identification tag will be sent in duplicate with the dog to be examined, and after the examination is completed one copy will be returned to the Philippine Health Service with the findings and signature of the pathologist. In addition to this, telephone message may be sent in case of emergency.

(4) When the health officer succeeds in getting a dog alive an observation of about 10 days will be sufficient to give a report

of "negative for rabies" provided that during such period no symptoms have developed and the dog remains alive. When on account of vicious habits or for other reasons a suspected dog cannot be caught alive and it becomes necessary to kill it, instructions should be given to policemen dealing with the case to avoid shooting the dog in any part of the body where the central nervous system may be injured. Post-mortem examination will be made by the Veterinarian, Bureau of Agriculture (at present in Pandacan) and report rendered at once to the health station from which the dead dog was sent. Dogs and other susceptible animals reported to have been bitten by the mad or suspicious dog will be subject to the same quarantine for such observation as is prescribed for suspicious dogs.

(5) Following a thorough investigation as to persons and animals bitten by a supposedly mad dog together with the collection of all interesting statistical data, comes the proper disposition of persons bitten, immediately upon receipt of a "Negri bodies positive" report. People who have been bitten by a mad or suspected dog shall be promptly notified of the results of the examination, the fact being emphasized and insisted on repeatedly of the necessity for them to undergo the antirabic prophylactic injections in the Bureau of Science or other properly equipped institution, as otherwise their lives will be seriously endangered by their contracting the disease. Not less than 21 serial injections are usually required.

6. As rabies is generally only transmitted by direct inoculation through the dog's bite, no process of isolation, quarantine, or disinfection will be instituted for human cases.

68. For killing stray dogs without muzzles by poisoning with strychnine the following precautions shall be taken:

1. The poison should be prepared only by sanitary inspectors, under the supervision of presidents of sanitary divisions, and no one else should be allowed to touch the prepared meat. The finger nails should be cut short before touching, and the hands carefully washed with soap and water afterwards.

"The strychnine is being sent out in bottles of ten grammes each, this amount being sufficient for from 100 to 150 dogs. When the bottles are emptied they must be returned to this office for refilling, and the receipt accompanying each bottle promptly signed and returned here.

"Tied or muzzled dogs or those in houses, are not to be bothered, and especial precautions should be taken to prevent the use of the drug by other animals, by chickens, or by children. Be *very, very careful* in this matter.

"When an unmuzzled dog is found loose, a piece of poisoned

meat should be thrown to him, and the sanitary inspector should remain there until it is eaten. If the dog refuses to eat it, it should be picked up, and later given to some other dog. All dead ones should be buried at once.

"Some sanitary inspectors have reported that fresh meat cannot be obtained at all times. Use dog meat. This has been done in some towns with good results.

"You are dealing with a deadly poison, and are again warned to use CARE—CARE—CARE."

The treatment against rabies consists of twenty-five (25) subcutaneous injections, one of which is given each day, hence the course of treatment covers twenty-five (25) days. Injections should be made in the back or in the interior abdominal wall of the patient, not in the arms or in the legs.

The dosage of the rabies vaccine should be in accordance with the table given below, which shows adult doses.

To children under five (5) years of age one-half of the adult dose may be given, to children from five (5) to ten (10) three-fourths ($\frac{3}{4}$) of the adult dose, and those over ten (10) years of age may be treated as adults. A few drops of formalin put into the wooden box will keep the outside of the bottles sterile.

TABLE.—*Dosage of Rabies Vaccine for Adults.*

Day.	Emulsion. cc	Salt solution. cc.
1.....	0.5	0.5
2.....	1.0	1.0
3.....	1.5	1.5
4.....	0.5	0.5
5.....	1.0	1.0
6.....	1.5	1.5
7.....	0.5	0.5
8.....	1.0	1.0
9.....	1.5	1.5
10.....	0.5	0.5
11.....	1.0	1.0
12.....	1.5	1.5
13.....	0.5	0.5
14.....	1.0	1.0
15.....	1.5	1.5
16.....	1.0	1.0
17.....	1.5	1.5
18.....	1.0	1.0
19.....	1.5	1.5
20.....	1.0	1.0
21.....	1.5	1.5
22.....	1.5	1.5
23.....	1.0	1.0
24.....	1.5	1.5
25.....	1.5	1.5

VENEREAL DISEASE GROUPS.

69. In the group of venereal diseases are included the following: syphilis; gonorrhea; and chancroid.

70. *Syphilis*.—Syphilis is a specific infection caused by a treponema. It runs a chronic course with local and general manifestations, usually divided into three stages, which are not always well defined.

Infectious agent.—The Treponema pallidum.

Incubation period.—About three weeks.

Quarantine period.—None.

Infective period.—As long as the lesions are present on the skin or mucous membranes and until the body is freed from the infecting organisms, as shown by microscopic examination of material from ulcers and by serum reaction (Wassermann test).

Sources of infection.—Discharges from the lesions of the skin and mucous membranes and the blood of infected persons, and articles freshly soiled with such discharges or blood in which the Treponema pallidum is present.

Modes of transmission.—By direct personal contact with the infected persons, and indirectly by contact with discharges from lesions or with the blood of such persons. In the large majority of all cases syphilis infection is transmitted during sexual intercourse.

Incidence.—Syphilis may be hereditary and contracted in all ages but being chiefly transmitted during sexual intercourse, the greatest incidence is registered from the age of 20 years.

Immunity.—There is no natural immunity to syphilis but one attack confers immunity and reinfection does not produce another chancre. If the disease is aborted by the timely use of salvarsan, reinfection may take place. The fact that no other chancre can be produced on the person reinfected has no influence upon the development of the secondary and tertiary lesions resulting from the first infection.

GONorrhoea.

71. Gonorrhoea is a specific infectious disease characterized principally by local lesions, though sometimes the infection may be generalized.

Infectious agent.—Gonococcus of Neiser.

Incubation period.—One to eight days, usually three to five days.

Quarantine period.—None.

Infective period.—As long as the gonococcus persists in any of the discharges, whether the infection be an old or a recent one.

Sources of infection.—Discharges from lesions of inflamed mucous membrane and glands of infected persons viz., urethral, vaginal, cervical, conjunctival mucous membranes, and Bartholin's or Skene's glands in the female, and Cowper's and the prostate glands in the male.

Mode of transmission.—By direct personal contact with the infected persons, and indirectly by contact with articles freshly soiled with the discharges of such persons. Gonorrhoea is usually transmitted by sexual intercourse; however, accidental or innocent infections are not infrequent, especially in children.

Incidence.—Gonorrhoea may occur in all ages but by its peculiar character is most frequent in adults and more in males than in females. Children with frequency acquire the disease at time of birth or from the hands of the attendants. In schools outbreaks of the infection have been registered, also in hospitals, asylums, public bath or by using a public water-closet.

Immunity.—None.

CHANCROID.

72. Chancroid is a specific, local, antoinoculable, and contagious venereal ulcer.

Infectious agent.—The streptobacillus of Duercy.

Incubation period.—From 3 to 5 days.

Quarantine period.—None.

Infective period.—As long as the bacillus of Duercy persists in the open ulcer.

Source of infection.—Mainly by direct contact.

Mode of transmission.—Chancroids are usually contracted by sexual intercourse.

Incidence.—More frequent among adults.

Immunity.—None.

METHODS OF CONTROL OF VENEREAL DISEASE GROUPS.

73. *The infected individual and his environment.*—(a) Recognition of the disease by clinical symptoms, confirmed by bacteriological examination or serum reaction. (b) Isolation. When the lesions are in the genito-urinary tract, exclusion from sexual contact, and when the lesions in gonorrhoea are conjunctival exclusion from school or contact with children, as long as the discharges contain the infecting organism. (c) In case of syphilis also exclusion from sexual contact and from preparation or serving food during the early and active period of the disease; otherwise none, unless the patient is unwilling to heed, or is incapable of observing the precautions required by the medical adviser. (d) *General measures.*—Education in matters of sexual hygiene, particularly as to the fact that continence in both sexes

at all ages is compatible with health and development. (e) Provision for accurate an early diagnosis including Wassermann test and treatment, in hospitals, clinics and dispensaries, of infected persons, with consideration for privacy of record and provision for following up cases until cured. (f) Repression of prostitution by use of police power and control of use of living premises. (g) Restrictions of advertising of services or medicines for the treatment of sexual diseases, etc. (h) Abandonment of the use of common towels, cups, and toilet articles and eating utensils. (i) Use of prophylactic silver solution in the eyes of the newly born for gonorrhoea. (j) Personal prophylaxis should be advised to those who expose themselves to infection (k) Obligatory reporting of cases by all official or private physicians and nurses. (l) Supervision of cases. (m) Educational lectures given by male lecturers before men's and boys' schools, clubs, factories, labor unions, jails, asylums, colleges and other organizations, and by female lecturers before similar institutions for women. (n) Patients must not marry until cured. (o) Concurrent disinfection of discharges and of articles soiled therewith.

OPHTHALMIA NEONATORUM.

74. Definition.—Ophthalmia neonatorum is an inflammatory disease registered in the newly born infants, characterized by inflammation of the eyes, including the conjunctivae.

Infectious agent.—The gonococcus has been demonstrated in 65 per cent of all cases, mild and severe. Ophthalmia neonatorum is not always gonorrhoeal, may also be produced by other virulent microorganisms or by irritating substances.

This Manual will deal on gonorrhoeal ophthalmia alone.

Incubation period.—The infection usually occurs shortly after birth or before the end of the first month.

Quarantine period.—None.

Infective period.—From first symptoms to disappearance of microorganisms in the lesions.

Source of infection.—Discharges from eyes and secretions of infected persons.

Mode of transmission.—The infection commonly occurs during the passage of the child through the genital tract of the mother, usually before delivery. Also may be caused after delivery by infected hands, towels, sponges, or other objects.

Incidence.—Most frequent among newly born children.

Immunity.—None.

Control.—(a) Prophylactic treatment of eyes of the newly born, using silver nitrate solution (Crede's method) or argyrol

solution. (b) Reporting of cases of eye inflammation in infants. (c) Education of ignorant midwives in their duties regarding this disease. (d) All other measures for gonorrhoea.

TRACHOMA.

75. Definition.—It is an infectious granulation of the eyelids characterized by chronic progression which threatens vision.

Infectious agent.—It has been proved that trachoma is due to specific organisms but the chief, although not yet known to be the only infectious agents, are the hemoglobinophilic bacilli, the so-called Koch-Weeks bacillus.

Incubation period.—Undetermined.

Quarantine period.—None.

Infective period.—During the persistence of lesions of the conjunctivae and of the annexed mucous membranes or of discharges from such lesions.

Modes of transmission.—By direct contact with infected persons and indirectly by contact with articles freshly soiled with the infective discharges of such persons.

Incidence.—All ages.

Methods of control.—(a) Recognition of the disease by clinical symptoms and bacteriological examination of the conjunctival secretions and lesions. (b) Isolation of the patient. (c) Exclusion of the patient from general school classes. (d) Concurrent disinfection of discharges and articles soiled therewith. (e) In the United States and Philippines trachoma is rigidly excluded by the immigration service.

ANTHRAX.

76. Definition.—Also called malignant pustule, carbunculus contagiosus, splenic fever, and mycosis intestinalis is primarily an infective disease of horses, cattle, sheep and other cloven-hoofed animals transmitted to man and characterized by lesions of skin (malignant pustule), in viscera or invading the blood originating a true septicemias.

Infectious agent.—Bacillus anthracis.

Incubation period.—Within 7 days.

Quarantine period.—During the whole course of the disease.

Infective period.—During the febrile stage of the disease and until lesions have ceased discharging. Infected hair and hides of infected animals may communicate the disease for many months after slaughter of the animal, and after curing of hide, fur, or hair, unless disinfected.

Source of infection.—(1) From infected herbivorous domestic

animals, viz, cattle, sheep and horses. (2) From hides, hair, flesh or other parts and feces of infected animals.

Mode of transmission.—(1) In workshops and factories where wool and hides from diseased animals have been used. Probably human beings are infected in most cases by direct inoculation; therefore, butchers, shepherds, farmers, carriers, rope makers, paper makers, and those who handle horse hair and wool are all exposed (through skin lesions and inspiration). (2) The sting of insects, e. g., flies, bringing the poison from diseased animals to be conveyed both to man and animals. (3) Inoculation as by accidental wound or scratch, inhalation of spores of the infectious agent and ingestion of insufficiently cooked infected meat.

Incidence.—All persons exposed may contract the disease without distinction as to age.

Immunity.—A number of species of animals have a natural immunity. Artificial immunity may be inducted in cattle or sheep but this procedure is not applicable to man.

Methods of control.—(a) Recognition of the disease by clinical symptoms confirmed by bacteriological examination. (b) Isolation of the infected individual until the lesions have healed. (c) Concurrent disinfection of the discharges from lesions and articles soiled therewith. (d) Terminal disinfection through cleansing. (e) Animals ill with a disease presumably anthrax should be placed in strict quarantine. (f) Immunization of exposed animals. (g) Milk from infected animals should not be used during the febrile period. (h) Control and disinfection of effluent and trade wastes and of areas of land polluted by such effluent and wastes from factories or premises where spore-infected hides or other infected hide and hair products are known to have been worked up into manufactured articles. (i) Every employee handling hides, hair, or bristles who has an abrasion of the skin should immediately report for treatment. (j) Special instruction should be given to all employees handling raw hides in regard to the necessity for personal cleanliness. (k) Tanneries and woolen mills should be provided with proper ventilating apparatus so that dust can be promptly removed. (l) Disinfection of hair, wool, and bristles of animals originating in known infected centers before they are used or assorted. (m) The sale of hides from an animal infected with anthrax should be prohibited. (n) Inspection and disinfection of imported hides. (o) The carcasses of animals dead from anthrax shall be burned or buried at least three feet deep. (p) It is important that in handling the body of an animal dead of anthrax *it is not opened and not allowed to shed blood*, for the bacillus does not produce its spore except in the presence of oxygen. (q) The neglect of

precautions in disposing of anthrax carcasses favors the spread of infection through the activity of carrion feeders. Buzzards may carry infection for long distances and dogs discharge anthrax spores in their feces 114 hours after feeding upon an anthrax carcass.

GLANDERS.

77. *Definition.*—“Glanders, also so-called farcy, is a communicable disease of horses, mules, asses and other animals and is readily communicated to man. It is characterized by the formation of inflammatory nodules either in the mucous membrane of the nose (glanders) or in the skin (fancy)”—(Rosenau).

Infectious agents.—Bacillus mallei.

Incubation period.—Least, unknown; average, 5 days; greatest, about 8 days.

Quarantine period.—During the whole course of the disease.

Infective period.—Until bacilli disappear from discharges or until lesions have healed.

Sources of infection.—Discharges from open lesions of mucous membranes or of the skin of human or equine cases of the disease (i. e., pus and mucous from the nose, throat, and bowel discharges from infected man and horses).

Mode of transmission.—Contact with a case or with articles freshly soiled by discharges from a human or equine case.

Immunity.—None.

Control.—(a) Recognition of the disease by specific biological reactions, such as the complement fixation test, the mallein test, the agglutination test, or by nonspecific reactions, such as the Straus reaction, if confirmed by culture, or by identification of the bacillus mallei or by autopsy of doubtful cases. (b) Isolation of human cases at home or hospitals; for infected horses destruction rather than isolation is advised. (c) Quarantine of all horses in an infected stable until all have been tested by specific reaction, and the removal of infected horses and terminal disinfection of stables have been accomplished. (d) Concurrent disinfection. Discharges from human cases and articles soiled therewith. (e) Terminal disinfection. Stables and contents in horse cases of the disease. (f) Abolition of the common drinking trough for horses. (g) Sanitary supervision of stables and blacksmith shops.

INFANTILE PARALYSIS.

78. *Definition.*—Infantile paralysis, also called infantile poliomyelitis, acute anterior poliomyelitis has not yet been registered in the Philippines. It is an acute infection of the nervous system

affecting particularly the spinal cord, characterized by partial paralysis and great intoxication.

Infectious agent.—Not definitely determined. Believed to be a filterable virus.

Incubation period.—From 3 to 10 days, commonly 6 days.

Quarantine period.—Usually for 14 days from last exposure to a recognized case and during the whole course of the disease.

Infective period.—Unknown; apparently not more than 21 days from the onset of the disease.

Sources of infection.—Nose, throat, and bowel discharges of infected persons or articles recently soiled therewith. Healthy carriers are supposed to be common.

Transmission.—(a) By direct contact with an infected person or with a carrier of the virus. (b) Indirectly by contact with articles freshly soiled with the nose, throat, or bowel discharges of such persons. (c) By insects, especially by the bite of the stable fly (*Stomoxys calcitrans*). (d) Experiment suggest that the disease may be conveyed by dust. (e) Food infection, inoculation through wounds and possibly other modes of transmission as yet unknown.

Incidence.—The disease affects infants as well as older children. The incidence fluctuates from year to year and from place to place.

Immunity.—One attack of infantile paralysis apparently confers a high degree of immunity.

Control.—(a) Recognition of the disease by clinical symptoms, assisted by chemical and microscopical examination of the spinal fluid. (b) *Isolation* of cases: (1) for a period of not less than two weeks nor more than three weeks from onset is required unless the temperature has not returned to normal in the meantime. (2) The children of the same household in contact with a patient to be excluded from places of public assembly for a period of 14 days from last date of contact, as determined by the health officer. (3) Adults of the household, if the patient is properly isolated, may continue their vocation, provided it does not bring them into contact with children at any time.

(c) *Disinfection.*—(1) The discharges from the nose, throat and bowels of the patient must be disinfected promptly. (2) The caretaker must wash her hands with soap and hot water promptly after handling such discharges. (3) The caretaker must also wash her hands similarly before leaving the room occupied by the patient. (4) Isolation must be terminated by a thorough washing of the entire body and hair of the patient, and the room cleansed with soap and hot water, aired and sun-

ned. (5) Sick room precautions include the usual attention to cleaning and disinfection of eating utensils, personal and bed clothing, rugs, door knobs and other things handled by the patient or caretaker. (d) Surveillance for persons coming from infected districts is not necessary unless the person has been definitely exposed to infection. (e) Food, especially such as is consumed uncooked, should be considered as a possible means of transmitting the infectious agent, and appropriate measures should be instituted to protect the public during outbreak. (f) Where poliomyelitis occurs in a school, the school need not be closed, but daily medical supervision should be instituted. (g) Efficient screening and the use of approved insecticides should be employed so that insects shall not have access to the patient or his excretions. (h) Household pets should be excluded from the sick-room. (i) In case of epidemic all children having fever should be isolated in screened rooms or under netting pending diagnosis. (j) Prompt reporting of all recognized or suspected cases.

LEPROSY.

79. *Definition.*—Leprosy is a communicable disease manifested under two types, the tubercular and the anaesthetic.

Infectious agent.—Hansen bacillus (*bacillus leprae*).

Incubation period.—Prolonged, undetermined.

Quarantine period.—Isolation for life, or until after two years of observation after four consecutive negative results in the examination of blood with a period of six months interval between examinations.

Infective period.—During the whole course of the disease.

Sources of infection.—Discharges from lesions.

Transmission.—By close, intimate, and prolonged contact with infected individuals. Flies and other insects may be mechanical carriers.

Incidence.—All ages.

Immunity.—None.

Control.—In the Philippines the only measure permitted is the isolation of patients in the Culion Leper Colony.

TETANUS.

80. *Definition.*—Tetanus is an acute and, in the absence of antitoxin treatment, fatal intoxication of the nervous system, characterized by muscular spasms, and caused by the toxin of specific agents.

Infectious agent.—*Bacillus tetani*.

Incubation period.—Six to fourteen days, usually nine.

Quarantine period.—None.

Infective period.—Only during the time that wound discharges are infectious.

Source of infection.—Animal manure and soil fertilized with animal manure and rarely, the discharges from wounds.

Mode of transmission.—Inoculation, or wound infection.

Incidence.—All ages.

Immunity.—An attack of tetanus does not confer immunity. Artificial immunization may be obtained by the application of antitoxin, single or repeated injections.

Control.—(a) Recognition of the case by clinical symptoms and confirmed by bacteriological examination. (b) Artificial immunization by the use of antitoxin. (c) Supervision of the practice of obstetrics. (d) Prophylactic use of tetanus antitoxin in case of wounds acquired from sources contaminated with manure, or with soil fertilized with manure, and where the wounds are ragged or penetrating. (e) Supervision of biological products, especially vaccines and sera. (f) Removal of all foreign matter as early as possible from all wounds. (g) In Manila all cases recognized as tetanus shall be isolated in San Lazaro Hospital.



